MAINTENANCE MANUAL

Basil® 4700 Cage and Rack Washer

(2008/10/15) **P764333-097**

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OPERATOR MANUAL

Basil® 4700 Cage and Rack Washer

(2008/08/14) **P920509-645**

A WORD FROM STERIS CORPORATION

This manual contains important information on the proper use of this equipment. Refer to *SECTION 6, ROUTINE MAINTENANCE,* for instructions in routine care of this washer. **All personnel and department heads are urged to carefully review and become familiar with the Safety Precautions and instructions contained herein.** These instructions are important to protect the health and safety of personnel operating this **Basil® 4700 Cage and Rack Washer** and should be retained in a conveniently accessible area for quick reference. This equipment is specifically designed only for the uses outlined in this manual.

Complete instructions for uncrating and connecting utilities, as well as equipment drawings, have been provided. If they are missing, contact STERIS for replacement copies, providing the serial and model numbers of the unit.

Advisory

IMPORTANT: *A listing of the Safety Precautions to be observed when operating this washer can be found in SECTION 1. Do not operate the equipment until you have become familiar with this information.*

Any alteration of this equipment not authorized or performed by STERIS will void the warranty. Alteration of equipment which could adversely affect its operation and efficacy may violate national, state and local regulations and could jeopardize your insurance coverage.

Indications For Use

The **Basil 4700 Cage and Rack Washer** is specifically designed for thorough, efficient cleaning of cages, bottles, debris pans and miscellaneous items used in the care of laboratory animals.

This washer is specifically designed to only process goods as outlined in this manual. If there is any doubt about a specific material or product, contact product manufacturer for recommended washing technique.

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Service Information

A thorough preventive maintenance program is essential to help ensure safe and proper equipment operation. Customers are encouraged to contact STERIS concerning extended service maintenance agreements to give the equipment planned maintenance.

A global network of skilled service specialists can provide periodic inspections and adjustments to help ensure low-cost peak performance. STERIS can provide information regarding the annual maintenance agreements.

STERIS carries a complete line of accessories for use in this equipment. Please contact STERIS for details.

Certification

This **Basil 4700 Cage and Rack Washer** meets the applicable requirements of the following standards:

- **Underwriters Laboratories, Inc. (UL)**
  UL 61010-1, Second Edition.
- **Canadian Standards Association (CSA)**
  CAN/CSA-C22.2 No. 61010-1, Second Edition.

Manufacturer:
Corporation STERIS
Canada
Quebec, Qc, CANADA

ISO 13485
ISO 9001
Certified
Facility

The base language of this document is ENGLISH. Any translations must be made from the base language document.

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SAFETY PRECAUTIONS

1

The following *Safety Precautions* **must** be observed when operating and servicing this **Basil® 4700 Cage and Rack Washer**. WARNING indicates potential for personal injury and CAUTION indicates potential for damage to equipment. For emphasis, certain *Safety Precautions* are repeated throughout the manual. **It is important to review ALL *Safety Precautions* before operating and servicing the unit.**

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:

⚠ Only STERIS or STERIS-trained service technicians should make repairs and adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel or installation of unauthorized parts could cause personal injury, invalidate warranty or result in costly damage. Contact STERIS regarding service options.

⚠ Regularly scheduled preventive maintenance, in addition to faithful performance of minor maintenance described in this manual, is required for safe and reliable operation of this equipment. Contact STERIS to schedule preventive maintenance.

⚠ To open doors from inside wash chamber, pull EMERGENCY STOP cables. Washer operation will automatically stop. Then, push firmly on door panel using shoulder and upper arm, applying upper body force.

WARNING – PERSONAL INJURY HAZARD:

⚠ Always wear appropriate Personal Protective Equipment (PPE) when cleaning or removing debris from bottom of wash chamber and over suction plate.

⚠ Never perform cleaning of wash chamber until full cycle has been completed. If cycle has not been completed, contaminated debris or water may remain in the bottom of the wash chamber.

⚠ Keep fingers away from door hinges to prevent pinching.

⚠ Items in washing cart may move during processing and be filled with residual hot water or protrude from cart at the end of the cycle. Always wear appropriate Personal Protective Equipment (PPE) and carefully remove utensils and items from cart.

⚠ To prevent tipping, place biggest and heaviest items on the lower levels of accessory cart.

WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD:

⚠ Washer detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin or attempt to swallow. Read and follow precautions and instructions on detergent label and in Material Safety Data Sheet (MSDS) prior to handling detergent, refilling detergent container or servicing detergent injection pump or lines. Wear appropriate Personal Protective Equipment (PPE) whenever handling detergent or servicing detergent injection pump and lines.

⚠ Wear appropriate Personal Protective Equipment (PPE) when removing clamps and replacing squeeze tubes. Residual chemicals might remain in used squeeze tubes. If chemical contacts skin or eyes, immediately flush with running water for at least 10 minutes. If contact was with eyes, seek medical attention.

⚠ Wear gloves and eye protection when using a descaling product. Avoid contact with eyes or skin. If spilled or splashed, flush with plenty of water for 15 minutes. If swallowed, DO NOT induce vomiting. Administer an alkali with plenty of water. Seek medical attention immediately.

WARNING – ELECTRIC SHOCK HAZARD:

Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

WARNING – BURN HAZARD:

Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.

Inner surfaces of washer are very hot after cycle completion. Operator should wear appropriate Personal Protective Equipment (PPE) and avoid all contact with inner walls when entering chamber to unload washer.

Pipes may be extremely hot.

When cycle is complete, partially open chamber door and allow chamber and load to cool. Hot steam may escape through door opening if door is fully opened after a cycle.

WARNING – SLIPPING HAZARD:

To prevent slips, keep floor dry. Promptly clean up any spills or condensation. If spilled liquids are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

CAUTION – POSSIBLE EQUIPMENT DAMAGE:

Always use non-foaming chemical for effective cleaning and proper pump and water level control operation. Follow manufacturer's recommendations for amount of chemical to be used.

Always use a silicone lubricant to lubricate squeeze tubes. Petroleum-based lubricants, such as Vaseline®[1] or grease, will cause squeeze tubes to melt.

Avoid product damage. Always select a cycle appropriate for items being processed.

Before operating unit, always position manifolded Bottle Washing Cart over central water inlet connector. If manifolded accessory is not positioned correctly, damage may result and unit will be unable to effectively wash load.

Do not process load using Bottle Washing Cart when Automatic Floor Tilting option is activated. If Automatic Floor Tilting is used, manifolded water inlet and washer will be damaged.

Remove all cellulose-type bedding from cages and pans before processing. Cellulose bedding can clog filters and piping.

CAUTION – POSSIBLE EQUIPMENT DAMAGE (Cont'd):

⚠ Use nonabrasive cleaners when cleaning unit. Follow directions on containers and rub in a back-and-forth motion (in same direction as surface grain). Abrasive cleaners will damage stainless steel. Cleaners rubbed in a circular motion applied with a wire brush or steel wool will scratch and dull stainless steel. Do not use these cleaners on painted surfaces.

⚠ When choosing a detergent, select one with a low chloride content. Detergents with a high chloride content can corrode stainless steel.

1 Vaseline is a trademark of Cheseborough Pond's Incorporated.

Tables 1-1 and 1-2 define certain symbols which may be on your **Basil 4700 Cage and Rack Washer** components:

Table 1-1. Definition of Symbols on Unit

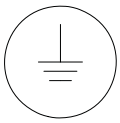
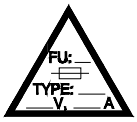
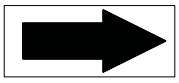
Symbol	Definition
	Protective Earth (Ground).
	Fuse Identification.
	Pump Rotation.
	Attention, Consult Manual for Further Instructions.
	Warning! Risk of Electrical Shock.

Table 1-2. Definition of Symbols on Identification Nameplate

Symbol	Definition
MODEL	Model Number of The Unit.
S/N	Serial Number of The Unit.
V3~	Volt, Number of Phase (3 or 1), Alternate Current.
WIRE	Number of Wires In The Electrical Cable (Ground Not Included).
YEAR	Year of Manufacture of The Unit.
k	Kilovolt-Ampere.
A	Amperage.
Hz	Hertz – Frequency of The Unit.

INSTALLATION VERIFICATION

2

IMPORTANT: *A listing of the Safety Precautions to be observed when operating this Cage and Rack Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.*

2.1 Technical Specifications

Complete uncrating and installation instructions, as well as an equipment drawing have been furnished. If any of these documents are missing or misplaced, contact STERIS giving serial, equipment and model numbers of the unit. Replacement copies will be sent to you promptly.

These specifications are intended to describe technical information given on nameplate of your washer and to state other relevant information. Check equipment drawing or identification nameplate for proper voltage and amperage.

2.1.1 Voltage, Amperage and Power Consumption

Basil® 4700 Cage and Rack Washer operates on:

208 V, 60 Hz, 3-phase, 25 Amps;

480 V, 60 Hz, 3-phase, 15 Amps.

A protective ground is required (Class 1 Equipment).

Maximum currents and power consumptions are indicated on nameplate.

Main supply voltage not exceeding ± 10% of nominal voltage.

Installation category: Overvoltage Category II.

Always follow local electrical installation codes.

Refer to *Uncrating/Installation Instructions* (P920509-642) for proper connection.

2.1.2 Permissible Environmental Conditions

This equipment is designated to give optimal results under the following conditions:

Indoor use only;

Altitude of operation up to: 6,267 ft (2,000 m);

Maximum relative humidity is 80% for temperatures up to: 88°F (31°C) decreasing linearly to 50% relative humidity at 104°F (40°C);

Pollution degree 2.

2.1.3 Noise Level

Equivalent Sound Pressure Level: **84 dB (A)**. Results determined according to *ISO-3746: 1995 Standard: Acoustics Determination of Sound Power Levels of Noise Sources Survey Method.*

2.1.4 Seismic Anchorage System

A Seismic Anchorage System is available for seismic zone 3 and 4 requirements.

2.2 Installation Checklist

After your washer has been installed by qualified service technicians, complete the following checklist to assure installation is complete and correct. If you desire, contact STERIS and schedule a technician to test installation and demonstrate proper equipment operation.

- ❑ To allow service of unit without shutting off building supply lines, shutoff valves (not provided by STERIS) for maintenance purposes, are installed on steam and water lines to unit. Shutoff valves must be capable of being locked in OFF position only.
- ❑ Disconnect switches (not provided by STERIS) are installed in electric supply lines near washer and within 10' (3 m) of electrical control box. Disconnect switches must be capable of being locked in OFF position only.

  NOTE: If washer is installed next to other equipment, shut-off valves and disconnect switch should be placed so that service can be shut off to one piece of equipment at a time.
- ❑ Washer is positioned as shown on equipment drawing with required service clearance space and in relation to building supply lines.
- ❑ Washer must be installed between two walls with a key-locked service door so service side is not accessible to operators.
- ❑ Building steam line provides maximum dynamic steam pressure and flow rate to washer as specified on equipment drawing.
- ❑ Drip leg with steam trap installed in steam supply line.

- ❑ Building hot water line supplies water to washer at pressure and temperature specified on equipment drawing.
- ❑ Building cold water line supplies water to washer at pressure specified on equipment drawing.
- ❑ Electrical supply for washer is as specified on equipment drawing.
- ❑ Condensate returns are sized as specified on equipment drawing.
- ❑ Vent connections are sized as specified on equipment drawing.
- ❑ Recirculation pump pressure is within 25 to 60 psig.
- ❑ Recirculation pump motor rotating in direction shown by arrow.
- ❑ Self-cleaning screen assembly functioning properly.
- ❑ Carriage drive motor rotating in direction shown by arrow.
- ❑ Carriage drive system functioning properly.
- ❑ Carriage drive motor amperage within rating indicated on the motor.
- ❑ Optional exhaust fan rotating in direction shown by arrow.
- ❑ All piping is leak-free.
- ❑ Chamber sump steam coil functioning properly.
- ❑ Door safety switch(es) functioning properly.
- ❑ Cabinet joints are completely sealed, no leaks (for verification, run machine for 1/2 hour).
- ❑ Door(s) easily opens from inside of chamber.
- ❑ Safety cables immediately stop washer operation when pulled.
- ❑ Each gear box plastic cap removed and replaced with air vent provided.
- ❑ Floor surrounding unit has non-slip surface.

***IMPORTANT**: After a few weeks of operation, inspect unit for leaks. Retighten all clamps and connections.*

2.3 Chemical Additives Specifications

The selection of chemical additives is open for customer preference; however, in order to achieve optimal performance, the selected chemical additives must meet as a minimum, the following specifications:

Product Description	Use Dilution Range oz/gal (mL/L) Dilution	pH Range at Use	Other Applicable Requirements
Alkaline Chemicals	1/4 - 4 (2 - 32)	9.0 - 12.0	Liquid, non-foaming and viscosity below 200 SSU (0.0004623 ft2/sec).
Acidic Chemicals	1/4 - 4 (2 - 32)	3.0 - 6.0	Liquid, non-foaming, free rinsing and viscosity below 200SSU (0.0004623 ft2/sec).
Descalers	1/2 - 2	<2.5	Liquid, non-foaming, phosphoric acid-based and viscosity below 200SSU (0.0004623 ft2/sec).

NOTE: When choosing and using chemicals, take note of the following:

1) *Follow chemical label recommendations for concentration of chemical to use.*
2) *Follow chemical manufacturer's recommendations to determine the temperature of the WASH treatment.*
3) *Follow chemical manufacturer's recommendations for the amount of chemical used according to water hardness.*

To achieve maximum cleaning efficiency, select chemical appropriate to soil type being processed. STERIS recommends the following chemicals:

- **Cage-Klenz® 100 Alkaline Cage Wash Detergent** – (Alkaline) formulated to remove urine, scale, animal fats, oils and other organic soils from cage materials.
- **Cage-Klenz® 200 Acid-Based Cage Wash Detergent** – (Acidic) formulated to remove urine, scale, animal fats, oils and other organic soils from cage materials.
- **Liquid Descaler Acid-Based Scale Remover** – for removing scale and other hard water deposits. For use in animal care centers.

NOTE: Certain products may not be available in your area. Contact your STERIS representative for availability of these products and for ordering information.

IMPORTANT: *STERIS does not promote, recommend, nor endorse the use of any other type of chemical additives in the processing of articles in the Basil 4700 Cage and Rack Washers, such as drying agents, strong alkaline detergents (pH>12), alcohol rinses, and liquid germicides including hypochloric acid (bleach).*

> ***IMPORTANT:*** *A listing of the Safety Precautions to be observed when operating this Cage and Rack Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.*

3.1 Component Identification

Basil® 4700 Cage and Rack Washer is a heavy duty, large capacity hydrospray washer designed for thorough, efficient cleaning of cages, racks, debris pans and miscellaneous items used in the care of laboratory animals.

Washer is equipped with a user-programmable PLC control system capable of storing up to twelve treatment cycles to process a wide variety of loads. Computer control system monitors and automatically controls all cycle operations.

Before operating washer, it is important to become familiar with all control locations and functions (see Figure 3-1).

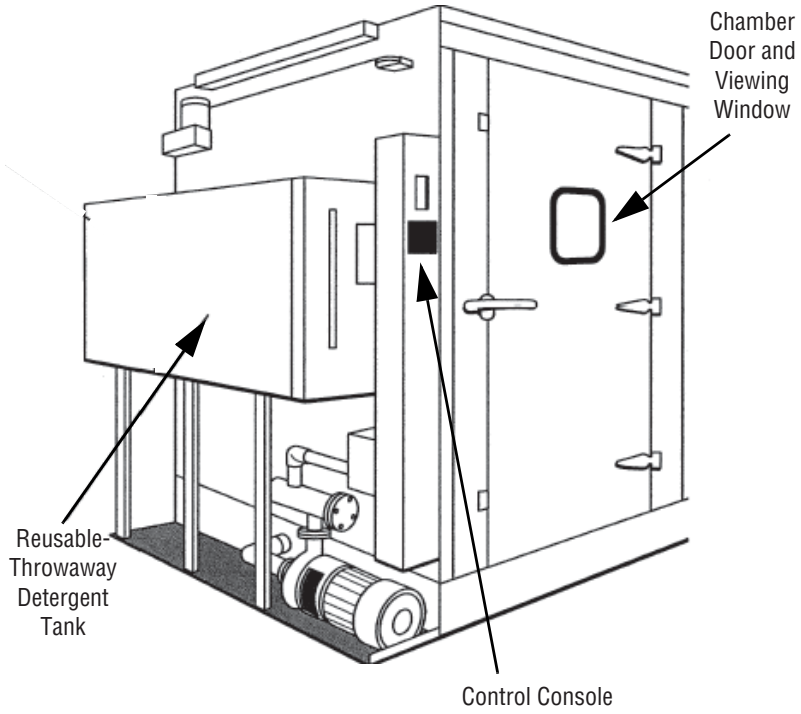


Figure 3-1. Basil 4700 Cage and Rack Washer Components

3.2 Operator Terminal

See Figure 3-2.

The **Basil 4700 Cage and Rack Washer** is equipped with an Allen-Bradley CompactLogix™ Programmable Logic Controller control system[1] that features twelve cycles for processing a wide variety of loads.

System monitors and controls washer operations and functions and also monitors current status of chamber, including current chamber temperature and time remaining in phase.

Control system offers four operation modes: Supervisor, Service, Automatic and Manual. The first two modes are password protected. Automatic and Manual modes are always available.

There is an operator terminal on load side and an operator terminal on unload side for double door units. Identical information is displayed on both load and unload operator terminals.

3.2.1 Login Passwords

Supervisors and service users with appropriate password can access Supervisor mode.

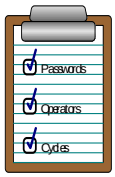
Only a qualified service technician can access Service mode. A predefined password is required to access Service mode.

3.2.2 Automatic and Manual Mode

Automatic and Manual mode can be selected from mode selection screen. No login is required to enter in Automatic or Manual modes.

When accessory rack is in proper position inside wash chamber, operator closes door, manually selects desired cycle on touch screen, presses **START** touch pad and appropriate cycle starts.

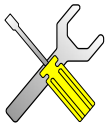
3.2.3 Supervisor Mode



Supervisor mode allows supervisor to modify preprogrammed cycles, parameters and options within a range of factory set values such as date and time and to enable printer functions.

Supervisor mode access is secured by a password. Supervisor password is configured in Supervisor mode.

3.2.4 Service Mode



Service mode allows a qualified service technician to access Service mode menu to configure washer and to perform preventive maintenance, testing and troubleshooting. Service mode is not accessible to operator or supervisor.

A predefined password is required to access Service mode.

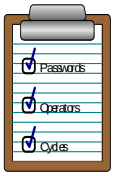
[1] CompactLogix™ is a trademark of Allen-Bradley, a Rockwell Automation Company.

3.2.5 Operator Terminal Touch Screen

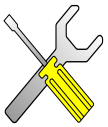
Operator terminal screen is a touch-sensitive color graphics screen. Touch screen displays current status of chamber, including current chamber temperature and phase remaining time, cycle data and operator instructions. Touch screen also indicates any faults that may occur during a cycle.

Touch pads are displayed on touch screen and vary from one menu to another. Some values may be selected in scroll down menus using arrows displayed on touch screen.

Touch Pads:

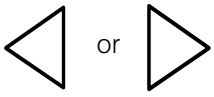


Supervisor mode: Press **Supervisor Mode** on Options screen to access Supervisor Mode Login screen.

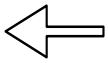


Service mode: Press **Service mode** on Options screen to access Service Mode Login screen.

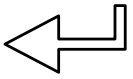
CLOSE: Press **X** (CLOSE) on touch screen to exit a screen and return to previous screen.



Left or Right arrow: For forward and back navigation. Press **Left** or **Right arrow** on touch screen to scroll across a screen to view all menus and/or possible selections available.



BACKSPACE: Used on Keyboard and Numeric Keyboard screens. Press **BACKSPACE** on touch screen to move one position backwards and delete the preceding space or character.



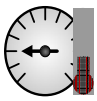
ENTER: Press **ENTER** on touch screen to confirm a selection and/or an entry.

STOP: Press **STOP** on touch screen to interrupt or abort cycle.

ALARM: Symbol displayed on Alarm screen, along with **FAULT** messages.

SILENCE BUZZER: Press **SILENCE BUZZER** on touch screen to stop alarm buzzer.

ACK: Press **ACK** on touch screen to stop alarm buzzer and acknowledge displayed **FAULT** messages.

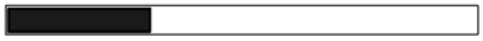


DETAILS: Press **DETAILS** on touch screen to view current cycle written data of parameters.

PRINT: Press **PRINT** on touch screen to print specific information from the Cycle, Service and Supervisor modes.

CYCLES: Press **CYCLES** on touch screen to access Cycles menu.

GEARS: Press **GEARS** on touch screen to access Machine Setup menu.



Progress Bar: **Progress Bar** is displayed on Chamber screen while cycle(s) is (are) in progress to show cycle(s) progress.

3.2.6 Audible Signal

An audible signal warns operator that an action must be taken.

3.3 LOCK/UNLOCK/ INIT Key Switch

The **LOCK/UNLOCK/INIT** key switch is located on control panel door and includes three positions:

- **LOCK** – Use key to turn selector switch to the left to **LOCK** position to lock washer for minor maintenance purposes (i.e. cleaning sump). The operator cannot start a new cycle or enter into the Service mode.

- **UNLOCK** – Use key to turn selector switch to **UNLOCK** position to unlock washer and enable washer to function normally, i.e. start cycles or enter into the Service mode.

- **INITIALIZATION** – Use key to turn selector to the right to reset washer normal operation after emergency stop cables or **EMERGENCY STOP** pushbutton were activated, after a power up or the return of current after a power failure.

  *NOTE: Selector returns automatically from initialization to **UNLOCK** position when key is released.*

LOCK/UNLOCK/INIT key switch can be turned only using a key. For added safety, key must be accessible only to trained operators.

3.4 Printer

See Figure 3-2.

A printer is available for use with the **Basil 4700 Cage and Rack Washer**. Refer to printer *User's Manual [PM190/192-TUD]* for detailed information about printer.

Printer allows operator to print cycle data and washer malfunction data. Specific information is printed from Cycle mode (cycle parameters, alarms), Service mode (washer configuration values) and Supervisor mode (supervisor's list, supervisor setup).

Printer uses 2-1/4" (57 mm) wide, 2" (50 mm) dia. single ply paper (P117913-393) and Ink ribbon (P117026-048)

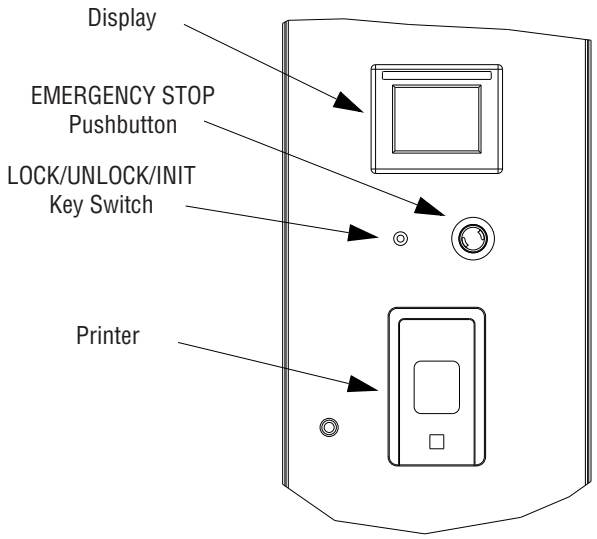


Figure 3-2. Operator Terminal and Printer

3.5 Typical Printouts

Figures 3-3 and 3-4 are examples of typical cycle printouts.

- **POWER UP**

  When Power Switch is set to **POWER**, generated printout lists time and date, control was turned on and unit's serial number.

- **CYCLE START**

  When cycle is started, generated printout lists name of cycle started, time and date cycle was started, cycle number and unit number.

- **IN-CYCLE PERFORMANCE**

  During a cycle, generated printout lists start and end time of each phase, along with actual temperature of solution/water in chamber sump.

- **END-OF-CYCLE PERFORMANCE SUMMARY**

  At end of a cycle, generated printout lists time cycle was completed, maximum wash and rinse temperatures reached during cycle and total cycle processing time.

- **ALARM CONDITION**

  When an alarm condition occurs, generated printout lists type of alarm and time it occurred (see Figure 3-3). Once operator presses **ACK** touch pad, generated printout lists time when alarm was acknowledged.

```
CYCLE - CYCLE 4

CYCLE START      2007-03-30   09:22:22
CYCLE COUNT      63
SERIAL NUMBER:   36XXXXXXXX

ALK. WASH
- START          09:28:59     47.5°C
- END            09:29:04     43.5°C
- DRAINING SUMP  09:29:15
- TEMPERATURE    31.0°C

ACID WASH
- START          09:30:45     81.9°C
- END            09:34:48     77.8°C
- ACID SOAK      09:34:53
- BYPASSED
- DAINING SUMP   09:35:86
- TEMPERATURE:   57.7°C

FINAL RINSE
- START          09:35:26     42.9°C
- END            09:35:37     32.5°C
```

Figure 3-4. Sample Printout

```
* ALARM
2007-03-30      09:43:59
COOLDOWN TANK TOO LONG TO DRAIN
```

Figure 3-3. Sample Alarm Printout

3.6 Oscillating Jet System

Oscillating jet system consists of two spray headers, one on each side of wash chamber, suspended from an oscillating carriage (see *FIGURE 3-5*). Each spray header is equipped with machined jets angled to reach all surfaces of load.

Oscillating jet system travels back and forth along length of chamber during recirculating/spraying phase function. Jet system is equipped with a safety clutch that stops movement of oscillating carriage if an obstruction is detected.

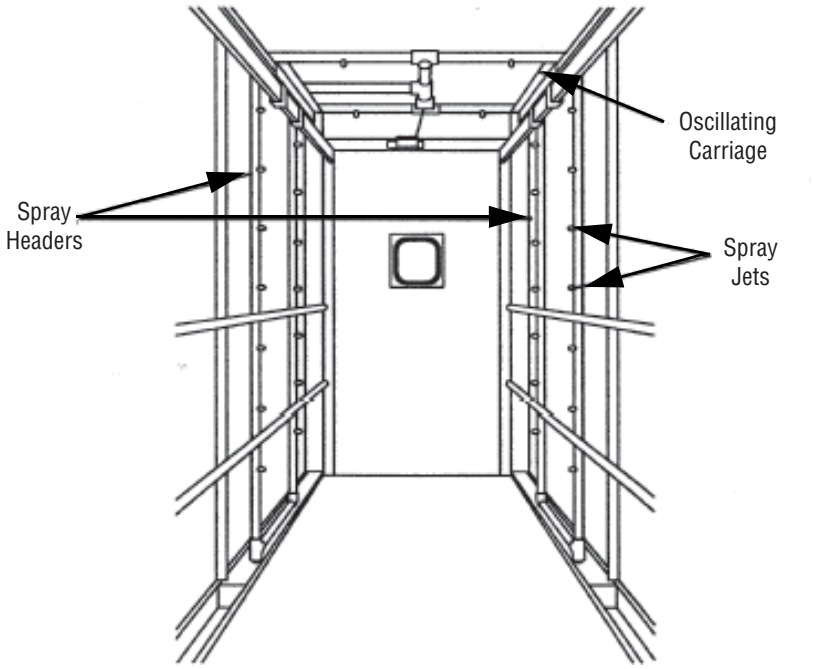


Figure 3-5. Oscillating Jet System

3.7 Safety System

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: To open doors from inside wash chamber, pull EMERGENCY STOP cables. Washer operation will automatically stop. Then, push firmly on door panel using shoulder and upper arm, applying upper body force.

Chamber doors are equipped with a safety switch to stop washer operation if door is opened during a cycle and to prevent start of washer operation if door is not securely closed.

Chamber doors are also equipped with a spring-loaded, explosion relief type safety latch. Door can be easily opened when pushed from inside of wash chamber.

Two stainless-steel, red-coated safety cables are installed inside wash chamber, one along each side (see *FIGURE 3-6*). If cable is pulled, washer operation is immediately stopped.

Oscillating jet system is equipped with a mechanical clutch to disengage carriage drive if an obstruction is encountered, preventing damage to spray headers and load items.

Load-side and unload-side control panels are equipped with EMERGENCY STOP pushbuttons. If pushbutton is pressed, washer operation is immediately stopped.

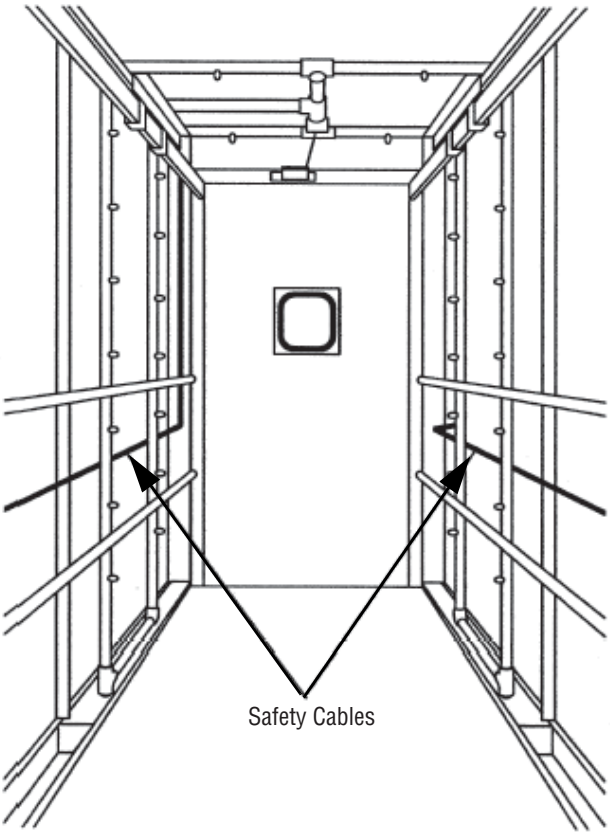


Figure 3-6. Safety Cables

3.8 Heat Exchanger

Washer is equipped with a steam heat exchanger and valving system to preheat incoming fill water, reducing normal water/solution heat-up time (see Figure 3-7).

System is fully automatic and works during filling function of Prewash, Wash treatment (if the corresponding tank is not present) and Rinse phases. Heat exchanger steam valve is energized only if temperature is below 165°F (73.9°C).

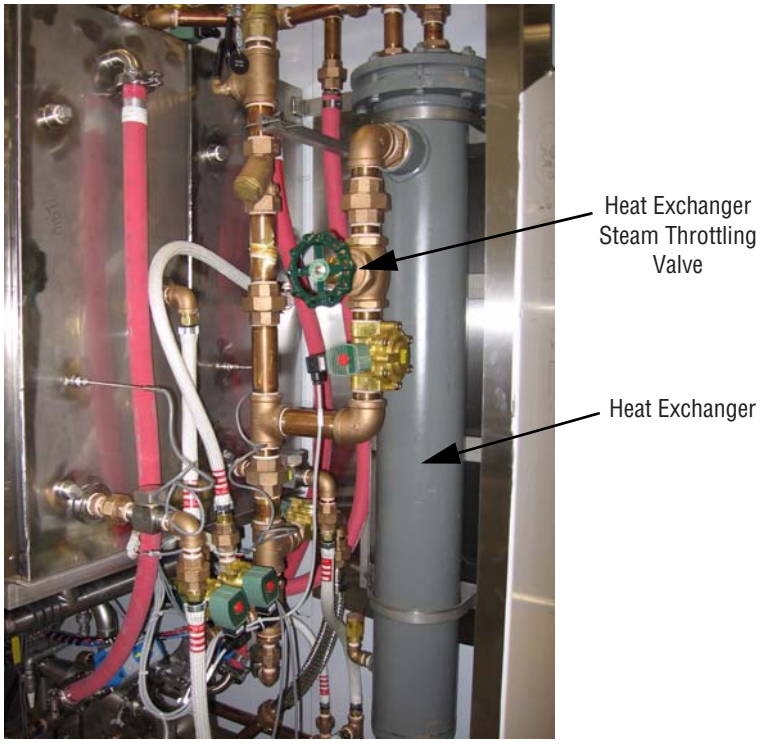


Figure 3-7. Heat Exchanger

3.9 Automatic Detergent Injection System

Automatic Detergent Injection System includes a peristaltic pump mounted to washer exterior. System also includes a conductivity probe located in chamber sump.

If using alkaline detergent with injection system, alkaline detergent is automatically injected into chamber sump during Wash phase of a cycle.

- Once sump is full, control checks detergent concentration of solution in sump. Alkaline detergent is then injected into sump until solution reaches set concentration level. Alkaline detergent solution is monitored and maintained at set concentration level while recirculating and spraying over load.

If using acid detergent with injection system, acid detergent is automatically injected into chamber sump during Acid Wash phase of a cycle.

- Once sump is full, control checks detergent concentration of solution in sump. Acid detergent is then injected into sump until solution reaches set concentration level. Acid detergent solution is monitored and maintained at set concentration level while recirculating and spraying over load.

3.10 Reusable-Throwaway Detergent System

Washers equipped with Reusable-Throwaway Detergent System can be programmed to either save or drain detergent solution on completion of phase.

System includes a separate detergent tank and piping constructed of stainless steel. Detergent tank is equipped with a steam coil to maintain detergent solution at programmed temperature. Reusable-Throwaway Detergent System can be installed for alkaline and/or acid detergent

3.11 Non-Recirculated Final Rinse

Washers equipped with Non-Recirculated Final Rinse System can be programmed to spray load with fresh, non-recirculated water during standard Final Rinse phase. System includes a separate spray header mounted directly to each side of oscillating carriage, inside of main spray headers (see Figure 3-8).

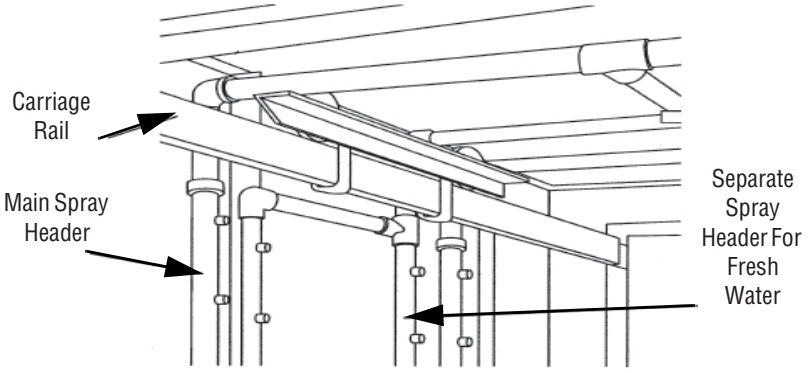


Figure 3-8. Non-Recirculated Final Rinse Spray Header

3.12 Feeder Bottle Washing System

Feeder Bottle Washing System provides capability of processing a loaded bottle cart during normal cycle operation. System includes a quick disconnect coupler.

NOTE: Bottle washing cart is available as a separate accessory.

Cycle must be programmed to process bottle cart during cycle operation.

3.13 Automatic Water Flush System for Two Racks

Automatic Water Flush System for two racks permits cleaning of facility's automatic watering system during normal cycle operation. System includes a set of two hoses, each equipped with a quick disconnect fitting, mounted on service side carriage rail.

Hoses are manually connected to customer cage watering racks moved into wash chamber. During Final Rinse filling, fresh hot water is sent through heat exchanger (for recirculated final rinse, temperature setpoint should be over 165°F [73.9°C] to activate heat exchanger) and sprayed over cage watering racks for programmed filling time interval.

3.14 Drain Discharge Cooldown with Side Tank and Temperature Guarantee

A separate tank is typically mounted along service side of washer to temporarily retain and cool all drain discharges (see Figure 3-9).

NOTE: Location of drain discharge side tank may change depending on other options ordered with washer.

During draining function of each phase, if sump water temperature is over 140°F [60°C], solution/water in sump is automatically pumped to side tank where cold tap water is added. Cold water remains on until water temperature in side tank reaches programmed set point. Once cooled to set temperature, side tank gravity drains to building drain system.

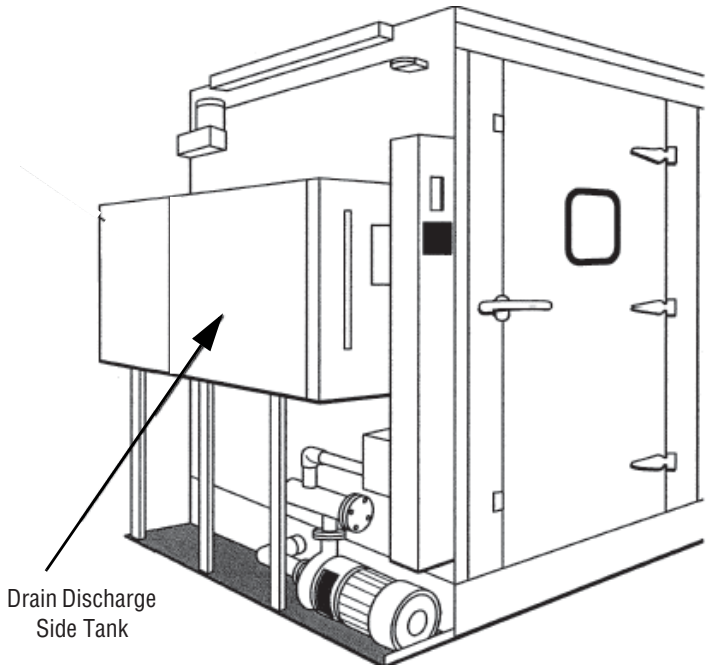


Figure 3-9. Drain Discharge Side Tank (Typical)

3.15 Drain Discharge Cooldown System with Cold Water Injection Only

Washer drain system is piped to automatically cool all drain discharges using building cold water supply.

During draining function of each phase, cold tap water is injected into washer drain line as washer drain discharges are sent directly to building drain system. Cold water remains on until sump drain valve closes.

3.16 Exhaust Fan

Exhaust Fan is mounted directly in washer exhaust line, on top of unit (see Figure 3-10).

During unit operation, exhaust fan removes residual vapors from wash chamber and directs vapors to building exhaust duct.

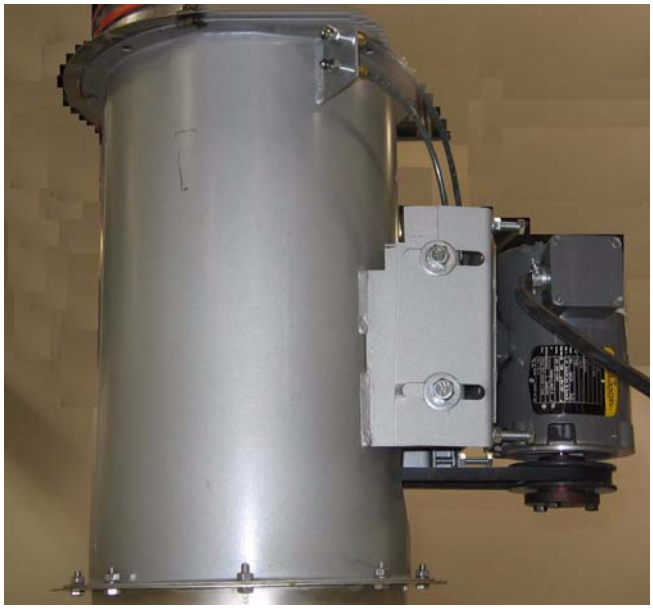


Figure 3-10. Exhaust Fan

IMPORTANT: *A listing of the Safety Precautions to be observed when operating this Cage and Rack Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.*

4.1 Before Operating Washer

Become familiar with location and function of all major components and controls of the **Basil® 4700 Cage and Rack Washer** as well as their function before operating equipment.

1. Verify building electrical supply disconnect switch (circuit breaker) is positioned to ON. Verify steam and water supply valves are open.
2. Open chamber door. Verify chamber is empty and all material has been removed.
3. Verify debris screens in bottom of sump are clean and properly installed.
4. Open printer door and check sufficient amount of printer paper is available.

   NOTE: A colored warning stripe is visible when printer paper roll is near the end. Refer to SECTION 6.6, PRINTER PAPER ROLL REPLACEMENT, if paper is needed.
5. If applicable, ensure manual drain valves on bottom of tanks and acid detergent tank are closed (see Figure 4-1).

Figure 4-1. Manual Drain Valves

6. Verify detergent supply (provided by customer). Check sufficient amount of detergent is available (Refer to *SECTION 6.5.5, REPLACING DETERGENT CONTAINER*). Ensure supply hose(s) is correctly placed in detergent container(s) and detergent pump(s) is turned on.

   NOTE: Always use a non-foaming detergent for effective cleaning and proper pump and water level control operation. To achieve maximum cleaning efficiency, select detergent appropriate to soil type being processed.

4.2 How to Load Washer

⚠ WARNING – PERSONAL INJURY HAZARD:

- **Items in washing cart may move during processing and be filled with residual hot water or protrude from cart at the end of the cycle. Always wear appropriate Personal Protective Equipment (PPE) and carefully remove utensils and items from cart.**
- **To prevent tipping, place biggest and heaviest items on the lower levels of accessory cart.**

⚠ CAUTION – POSSIBLE EQUIPMENT DAMAGE:

- **Before operating unit, always position manifolded Bottle Washing Cart over central water inlet connector. If manifolded accessory is not positioned correctly, damage may result and unit will be unable to effectively wash load.**
- **Do not process load using Bottle Washing Cart when Automatic Floor Tilting option is activated. If Automatic Floor Tilting is used, manifolded water inlet and washer will be damaged.**

To properly clean items and avoid personal injuries, always follow these general guidelines:

1. Assure no items stick out or hang out from rack. Always use a rack designed to handle appropriate type of items to be processed.
2. Use specific accessories designed to handle cages, bottles and pans.

   IMPORTANT: *Remove as much debris as possible from cages and pans before loading accessories.*

   - **Accessories** (see Figure 4-2):

     Bottle Washing Cart – Used for processing up to six bottle baskets. Requires Manifold Coupling System.

     Pan Cart – Used to wash pans, floor gratings, cage doors, etc.

     Universal Cage and Wash Cart – Used to wash 54 standard mouse boxes or 36 standard rat boxes.

     Rodent Cage Rack – Used to hold up to 92 mouse cages or 32 rat cages or shoe boxes, covers and feeder tops.

     IMPORTANT: *Use baskets for handling and cleaning various size bottles. Lightweight basket design provides easy handling and simplifies transport and washing of bottles.*

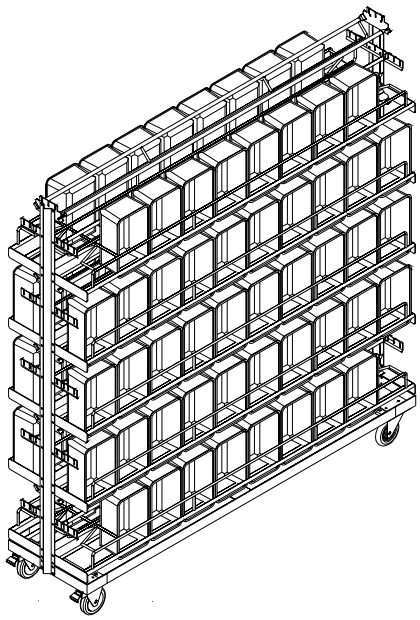
     5 x 5 Bottle Basket – Used to wash 25,16 oz (454 mL) bottles.

     4 x 6 Bottle Basket – Used to wash 24, 16 oz (454 mL) bottles.

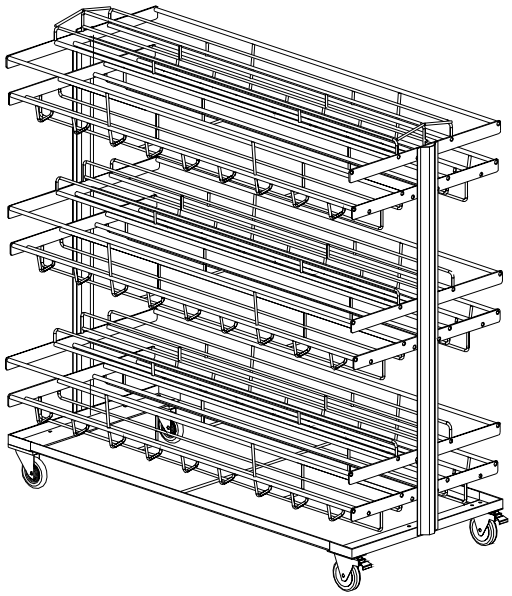
     5 x 5 Bottle Basket – Used to wash 25 short 4" (10 cm) bottles.

     4 x 6 Bottle basket – Used to wash 24 tall 5-1/2" (14 cm) bottles.

⚠ CAUTION – POSSIBLE EQUIPMENT DAMAGE: Remove all cellulose-type bedding from cages and pans before processing. Cellulose bedding can clog filters and piping.

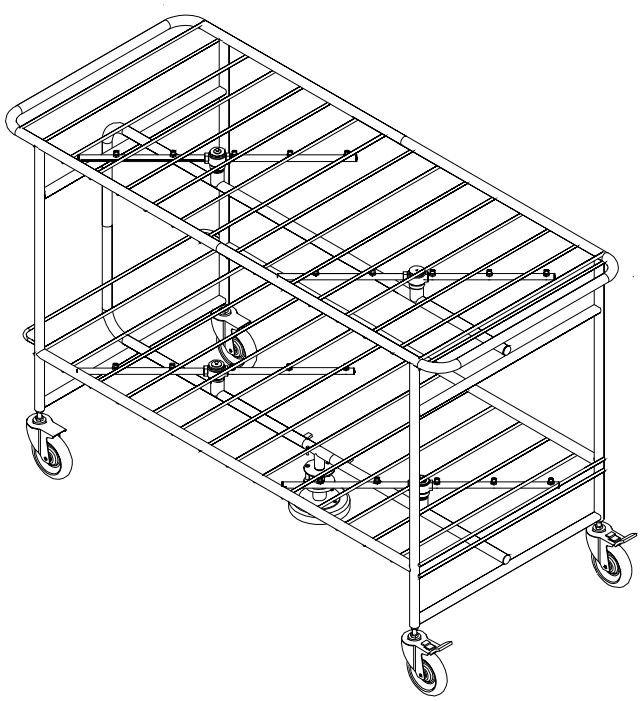


Rodent Cage Rack



Universal Cage and Pan Wash Cart

Pan Cart



Bottle Washing Cart (Typical)

Figure 4-2. Accessories

3. Open chamber door and push loaded wash cart(s) into wash chamber.
   a. Ensure all cages, racks, etc. are correctly positioned on wash cart(s).
   b. Position cart(s) in center of wash chamber. Verify clearance space on both sides of cart permits unobstructed movement of oscillating jet system.
4. Close and latch chamber doors securely.

   NOTE: Door safety switch prevents cycle operation unless door(s) is closed.
5. Start desired cycle.

4.3 Cycle Operation

Washer is equipped with a PLC control capable of storing parameters for twelve distinct cycles. Authorized operators have capability of customizing/programming all cycles to meet specific washing needs. For instructions on cycle programming or changing cycle parameters, refer to *SECTION 5, CYCLE AND CONTROL VALUE PROGRAMMING*.

WARNING – SLIPPING HAZARD: To prevent slips, keep floor dry. Promptly clean up any spills or condensation. If spilled liquids are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).
WARNING – PERSONAL INJURY HAZARD: Keep fingers away from door hinges to prevent pinching.
CAUTION – POSSIBLE EQUIPMENT DAMAGE: Avoid product damage. Always select a cycle appropriate for items being processed.

On initial receipt of washer, each cycle is set with a basic demonstration cycle consisting of six sequential phases – Pre-wash, Wash, Rinse 1, Rinse 2, Final Rinse and Exhaust. Refer to **Cycle Description Chart** in Section 5, for phase values.

To begin cycle operation:

1. **LOCK/UNLOCK/INIT** key switch must remain to **UNLOCK** position at all times except when entering wash chamber. Display shows Mode Selection screen.
2. On Mode Selection screen press **AUTOMATIC** touch pad. Unit name temporarily appears on screen, then screen displays first cycle selection menu.
3. Press **ARROW** touch pads to select other cycle selection screens.
4. When desired cycle name is displayed, press **CYCLE** touch pad.
5. Then, press **START** touch pad.
6. Washer automatically processes selected cycle as follows:

   NOTE: For cycle operation, take note of the following:

1) Time displayed on screen counts down time remaining for cycle.

2) Cycle operation may be halted at any time by pressing STOP touch pad. To resume cycle operation at beginning of interrupted phase function (i.e., fill, recirculate, drain), press RESUME touch pad. To abort cycle operation, press ABORT touch pad.

- **PRE-WASH PHASE**

  Hot water, from building supply, fills sump until required water level is attained.

  NOTE: Sump may contain rinse water retained from previous cycle.

Pre-wash water recirculates through oscillating jet system for programmed time interval.

Printer records time and water temperature in chamber sump at beginning and end of recirculation.

Water contained in traveling spray header is sent to sump (all units).

Sump water is pumped to drain.

Water still present in sump is gravity-drained (option).

- **ALKALINE WASH PHASE**

  Hot water, from building supply (or from alkaline wash tank, if option applies) fills sump.

  Alkaline detergent is injected into sump.

  Detergent solution is recirculated through oscillating jet system for programmed amount of time.

  Printer records time and solution temperature in chamber sump at beginning and end of recirculation.

- **HEADER DRAIN**

  If water is not returned to the tank, sump water is pumped to drain.

  If water saver not enabled, water still present in sump is gravity-drained (option).

  If water saver is enabled, sump water is sent back to alkaline tank.

  If sump flush option is available, water still present in sump is gravity drained.

  If sump flush option is available, water is injected in sump to remove debris.

  If sump flush option is available, refreshed water still present in sump is gravity drained.

- **ACID WASH PHASE**

  Hot water, from building supply (or from acid wash tank, if option applies) fills sump.

  Acid detergent is injected into sump.

  Detergent solution is recirculated through oscillating jet system for programmed amount of time.

  Printer records time and solution temperature in chamber sump at the beginning and end of recirculation.

  Load is soaked in Acid solution for programmed amount of time.

  Water contained in traveling spray header is sent to sump.

  Sump water is pumped to drain.

  If water saver not enabled, water still present in sump is gravity-drained (option).

If water saver is enabled, sump water is sent back to acid tank (if option applies).

If sump flush option is available, water still present in sump is gravity-drained.

If sump flush option is available, water is injected in sump to remove debris.

If sump flush option is available, refreshed water still present in sump is gravity-drained.

- **RINSE 1 PHASE**

  Hot water, from building supply, fills sump.

  Rinse 1 water is recirculated through oscillating jet system for programmed amount of time.

  Printer records time and solution temperature in chamber sump at beginning and end of recirculation.

  Water still present in sump is gravity-drained (option).

- **RINSE 2 PHASE**

  Hot water, from building supply, fills sump.

  Rinse 2 solution is recirculated through oscillating jet system for programmed amount of time.

  Printer records time and solution temperature in chamber sump at beginning and end of recirculation.

  Sump water is pumped to drain.

  Water still present in sump is gravity-drained (option).

- **FINAL RINSE PHASE**

  Hot water, from building supply, fills sump.

  Final Rinse solution is recirculated through oscillating jet system for programmed amount of time.

  Printer records time and solution temperature in chamber sump at beginning and end of recirculation.

  Water contained in traveling spray header is sent to sump.

  Sump water is pumped to drain.

  Water still present in sump is gravity-drained (option).

- **EXHAUST PHASE**

  Washer stands idle for programmed time interval allowing residual vapors to exhaust from wash chamber to room.

  Printer records time at the beginning and at completion of phase.

  NOTE: Customer must connect exhaust vent to building exhaust system to prevent directly exhausting vapors to room.

- **CYCLE COMPLETE**

  Alarm buzzer sounds and CYCLE COMPLETE is displayed. Alarm buzzer can be silenced by opening chamber door(s).

WARNING – BURN HAZARD: When cycle is complete, partially open chamber door and allow chamber and load to cool. Hot steam may escape through door opening if door is fully opened after a cycle.

⚠ WARNING – BURN HAZARD: Inner surfaces of washer are very hot after cycle completion. Operator should wear appropriate Personal Protective Equipment (PPE) and avoid all contact with inner walls when entering chamber to unload washer.

⚠ WARNING – PERSONAL INJURY HAZARD: Utensils and items in washing cart may move during processing and be filled with residual hot water or protrude from cart at the end of the cycle. Always wear appropriate Personal Protective Equipment (PPE) and carefully remove utensils and items from cart.

Instruction remains on screen until door(s) is opened.

Cautiously open chamber door to vent remaining steam vapors. Allow chamber to cool a few minutes before removing load. Display returns to Cycle Selection menu.

- **NEUTRALIZATION (Option)**

  Time Base (option):

  Recirculation pump and carriage system are activated all through neutralization phase.

  Selected pump is energized for the amount of time set into cycle phase (recirculation pump and jet valve are energized during neutralization process).

- **pH METER IN SUMP (Option) (Without Cooldown Tank):**

  Recirculation pump and carriage system are activated all through neutralization phase.

  NOTE: "inject", "containment", "wait" and "mix" time referred in the following section are values that can be set in service mode. There is an "inject", "containment" and "wait" value for each neutralizer pump.

  – IF pH is not within allowed range:

  Appropriate pump is pulsed ON and OFF until pH is within allowed range. The ON time of pump is the "inject" time if treatment uses detergent and pH has not overshoot. Otherwise the "containment" time, which is a shorter injection time to prevent overshooting, is used.

  The OFF time of pump is the "wait" time.

  – IF pH is within allowed range:

  When pH value is within allowed range, water is mixed for the "mix" time to ensure water remains within allowed range. If water gets out of allowed range, control resumes injection.

  If water is not within allowed pH range within 9 injections (default value adjustable in service mode) an alarm is generated.

- **pH METER IN COOLDOWN TANK (Option) (With Cooldown Tank):**

  Mixing motor is activated all through neutralization phase.

  NOTE: "inject", "containment", "wait" and "mix" time referred in the following section are values that can be set in service mode. There is an "inject", "containment" and "wait" value for each neutralizer pump.

  – IF pH is not within allowed range:

  Appropriate pump is pulsed ON and OFF until pH is within allowed range. The ON time of pump is the "inject" time if treatment uses detergent and pH has not overshoot. Otherwise the "containment" time, which is a shorter injection time to prevent overshooting, is used.

  The OFF time of pump is the "wait" time.

– IF pH is within allowed range:

When pH value is within allowed range, water is mixed for the "mix" time to ensure water remains within allowed range. If water gets out of allowed range, control resumes injection.

If water is not within allowed pH range within 9 injections (default value adjustable in service mode) an alarm is generated.

4.4 Review and Print Specific Cycle Program

All cycle programs may be reviewed by accessing Cycle Review mode when a cycle is not in progress. Cycle Review mode allows user to review cycle phases and values programmed for specific cycle selected.

1. Press **REVIEW** touch pad to access Cycle Review mode, and review first phase of selected cycle.
2. Press left and right arrow touch pad to review the other treatments of the cycle. Press **X** to exit the Cycle Review mode.

   To print cycle values select the cycle that should be printed and press **PRINT** touch pad.

4.5 Extend Cycle Phase Time

Cycle phase times may be temporarily extended by pressing Extend Phase touch pad while cycle is in progress. Temporarily extended phase times apply only to immediate cycle selected. On completion of cycle, phase times return to programmed setpoints.

After starting a cycle, programmed time for each phase may be temporarily extended only when particular phase process is in operation.

To extend phase time, press **EXTEND PHASE** touch pad while actual phase process (i.e., recirculating, exhausting) is in operation. Each time touch pad is pressed, programmed time setpoint is added to phase time remaining.

NOTE: Filling and draining functions are not affected by extend phase feature. If EXTEND PHASE touch pad is pressed during these functions, cycle continues as programmed.

4.6 Bypass Phase

A cycle phase may be bypassed only if Temperature Guarantee is not selected.

If Temperature Guarantee is not selected, cycle phase may be bypassed only while particular phase process is in operation. Bypassed phases apply only to immediate cycle in progress.

To bypass a phase, press **BYPASS** touch pad while actual phase process (i.e., recirculating, exhausting) is in operation.

Control aborts phase process in operation and automatically continues with next programmed function.

NOTE: Filling and draining functions cannot be bypassed.

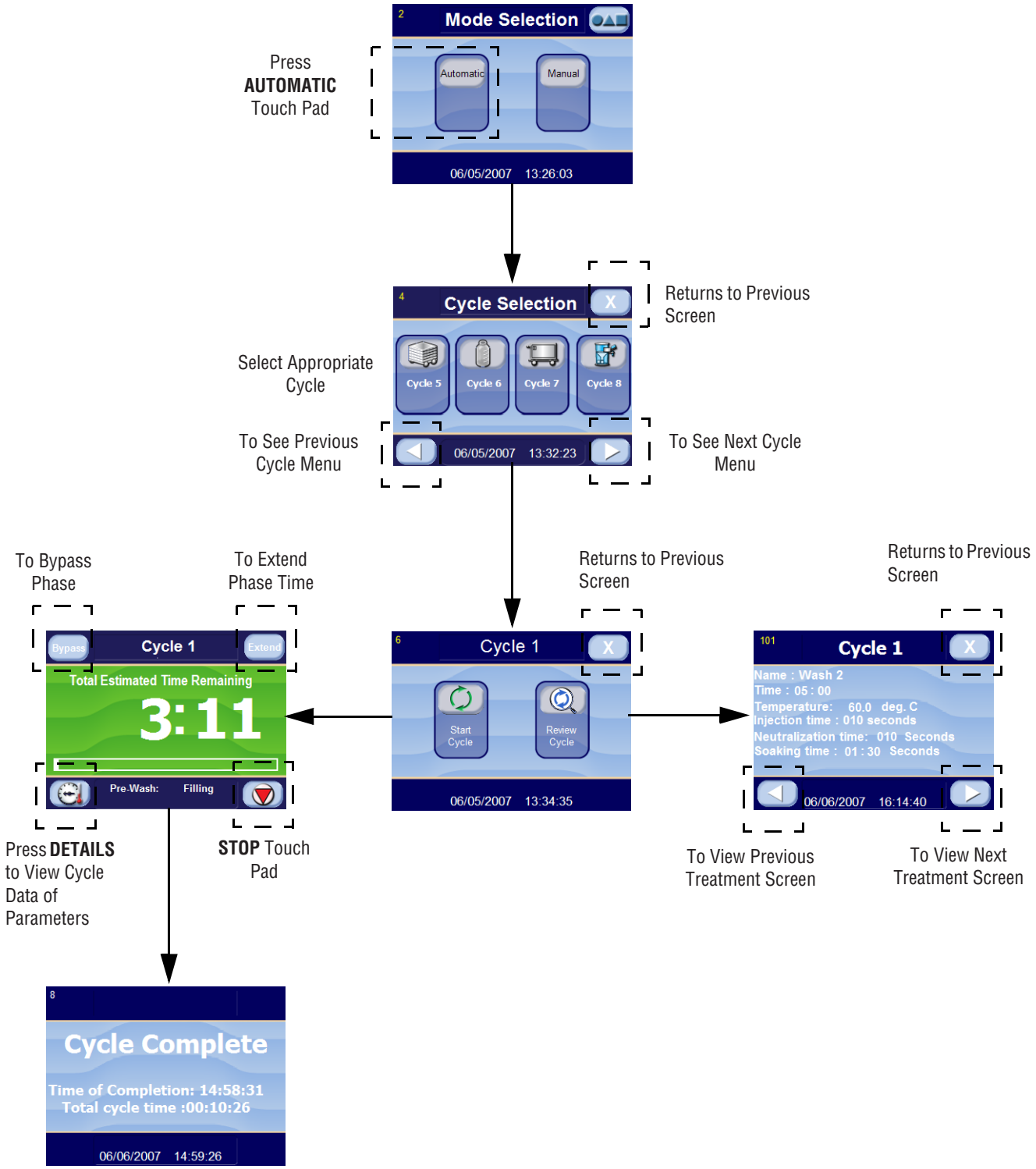


Figure 4-3. Cycle Operation: Display Flowchart (Typical)

4.7 Shutdown Procedure

At end of a work session, washer should be shut down and cleaned thoroughly. Refer to *SECTION 6, ROUTINE MAINTENANCE*, for complete cleaning instructions and scheduled minor maintenance.

WARNING – BURN HAZARD: Pipes may be extremely hot.

1. Access Manual Control mode (refer to *SECTION 4.8, MANUAL CONTROL MODE*) and drain washer sump.
2. Position building electrical disconnect switch to OFF and close building supply valves.
3. Open manual drain valves to completely drain detergent tank and optional acid tank, if desired.
4. Clean unit as described in *SECTION 6, ROUTINE MAINTENANCE*.
5. Ensure building electrical disconnect switch is positioned to ON after completion of cleaning and minor maintenance procedures.

   NOTE: Leaving disconnect switch in OFF position overnight shortens life span of PLC battery.

4.8 Manual Control Mode

Operator or service technician can manually control certain washer functions by accessing Manual Control Mode. Manual Control Mode is accessible from Mode Selection screen.

WARNING – SLIPPING HAZARD: To prevent slips, keep floor dry. Promptly clean up any spills or drippage. If spills or drippage are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

WARNING – BURN HAZARD: Pipes may be extremely hot.

To access Manual Control mode:

1. From Mode selection screen, press **MANUAL** touch pad.
2. To perform specific manual functions, refer to descriptions included in this section, titled same as shown on display screen. FILL selection allows manual filling of chamber sump. DRAIN selection allows manual draining of chamber sump and tanks. PUMP/DRV selection allows manual operation of recirculation pump(s) and carriage drive system. DRIVE selection allows manual operation of carriage drive system while chamber door is open or closed.

4.8.1 FILL Function

To access Manual FILL function:

1. In Manual Control Menu, press **FILL** touch pad.

   NOTE: If necessary, manual functions can be aborted at any time by pressing FILL touch pad.
2. When sump is full, filling sequence automatically stops.

4.8.2 DRAIN Function

To access Manual Drain functions, proceed as follows:

From Manual Control Menu, press **DRAIN** touch pad.

NOTE: During Manual Drain, note the following:

1) *Only available options are displayed. If alkaline tank, acid tank or cooldown tank are not present, corresponding selections are not displayed.*
2) *If necessary, manual functions can be aborted at any time by pressing touch pad corresponding to manual function selected.*

4.8.3 Draining Sump

To drain sump manually, proceed as follows:

1. From Drain Menu, press **SUMP** touch pad.
2. If sump is not already full, it is filled to prevent recirculation pump from running dry during draining sequence.
3. When sump is full, draining sequence starts.
4. Pump runs for DRAIN TIME. If unit is provided with a cooldown tank and cooldown tank is not empty, it is drained prior to draining sump.
5. When cooldown tank (option) is empty, sump is drained.

   NOTE: Draining sump can be aborted at any time by pressing DRAIN touch pad again.

4.8.4 Draining Alkaline Tank

To drain Alkaline Tank manually, proceed as follows:

1. From Drain Menu, press **ALK. TANK** touch pad.
2. Alkaline tank water is transferred to sump.
3. When sump is full, jet valve(s) closes, sump drain valve(s) opens and recirculation pump(s) turns on.
4. Pump runs for DRAIN TIME. This procedure is repeated until sump is not filled within TNK DRAIN time.
5. Pump runs for DRAIN TIME.

   NOTE: Draining Alkaline tank can be aborted at any time by pressing ALK. TANK touch pad again.

4.8.5 Draining Acid Tank

To drain Acid Tank manually, proceed as follows:

1. From Drain Menu, press **ACID TANK** touch pad.
2. Acid tank water is transferred to sump.
3. When sump is full, jet valve(s) closes, sump drain valve(s) opens and recirculation pump(s) turns on.

4. Pump runs for DRAIN TIME. This procedure is repeated until sump is not filled within TNK DRAIN time.
5. Pump runs for DRAIN TIME.

   NOTE: Draining acid tank can be aborted at any time by pressing ACID TANK touch pad again.

4.8.6 Draining Cooldown Tank

To drain Cooldown tank manually, proceed as follows:

1. From DRAIN Menu, press **COOLDOWN TANK** touch pad.

   NOTE: If unit is provided with a controller-driven pH monitoring system, water is neutralized prior to being drained.

2. Solution is cooled down (and Cool Down water valve energized) for COOLDOWN TANK time. At the end of neutralization phase (OPTION), tank is drained.

   NOTE: Draining cooldown tank can be aborted at any time by pressing COOLDOWN TANK touch pad again.

4.8.7 PUMP & DRV Function

To operate recirculation pump(s) and carriage jet system manually:

1. From Manual Control, press **CARRIAGE** touch pad.
2. If sump is not full, it is filled.
3. When sump is full:
   Recirculation pump(s) and carriage jet system start to operate until **PUMP & DRIVE** is pressed again.

   NOTE: Pump and drive operation can be aborted at any time by pressing PUMP & DRIVE touch pad again.

4.8.8 DRIVE Function

To operate carriage drive system manually:

1. From Manual Control Menu, press **DRIVE** touch pad.
2. Carriage oscillates until **DRIVE** is pressed again.

   NOTE: When activating Drive function, note the following:

1) Carriage system can be activated even if a door is open.

2) Drive function can be aborted at any time by pressing DRIVE touch pad again.

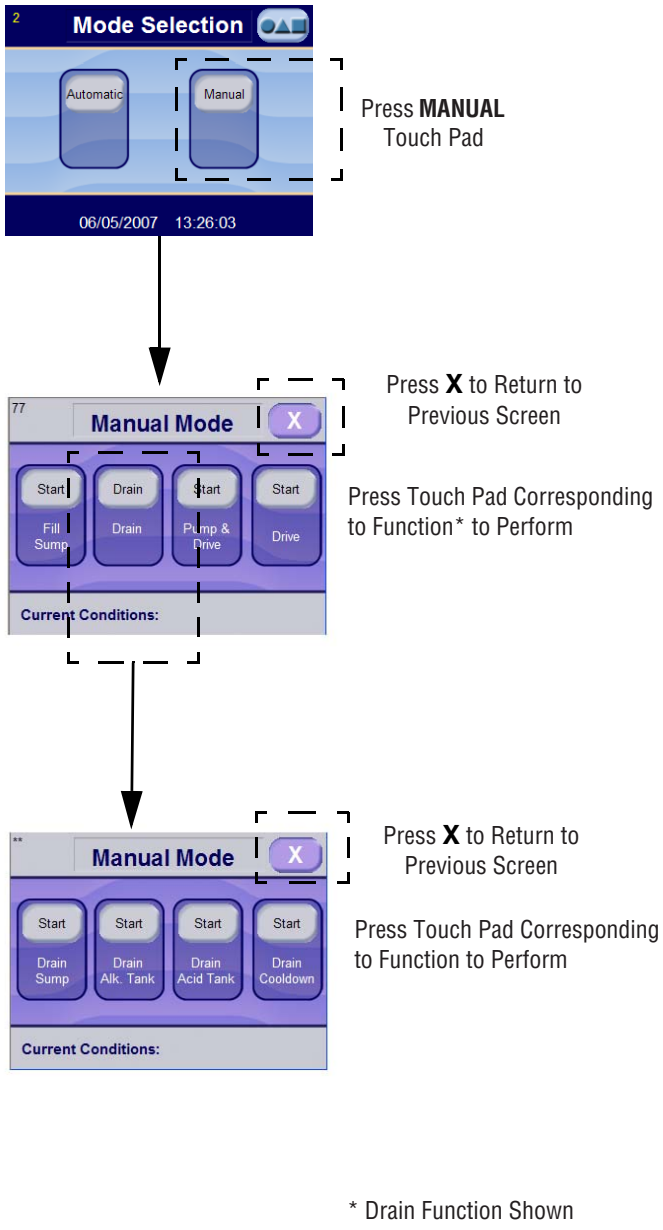


Figure 4-4. Manual Control Mode

4.9 Responding to a Fault

Fault messages warn operator washer is experiencing an abnormal condition. Fault conditions can be caused by failure of utility supplies or by washer components.

Refer to *SECTION 7, TROUBLESHOOTING*, for a detailed listing of fault alarms.

NOTE: Some fault conditions can be solved by operator.

1. When a malfunction or fault occurs before cycle is successfully completed, an alarm sounds and display shows:

(Typical Screen Message)

Printer message is:

```
==========================
Alarm
YYYY/MM/DD        HH:MM
--------------------------------------------------
DESCRIPTION OF ALARM
==========================
```

2. Press **SILENCE BUZZER** on touch screen to silence buzzer;

   or

   Press **ACK** on touch screen to acknowledge alarm and silence buzzer. This records time at which operator acknowledged alarm.

   Printer message is:

```
==========================
ALARM ACKNOWLEDGED09:42:40
 * CYCLE RESUMED AT 09:42:44
==========================
```

3. If **FAULT** alarm requires no further action (for example, refer to *SECTION 7, TROUBLESHOOTING*), or if operator has been able to solve fault condition using Troubleshooting Charts, press **RESUME CYCLE** on touch screen to resume cycle operation. Cycle resumes at beginning of phase where cycle was interrupted.

4. If **FAULT** alarm requires to abort cycle, press **ABORT CYCLE** on touch screen to abort cycle. Washer performs Abort sequence. See *SECTION 4.11, ABORT A CYCLE*, for details on Abort sequence.

4.10 Pause a Cycle

If operator needs to pause a cycle, washer operation can be halted at any time by pressing **STOP** on touch screen. Once interrupted, cycle either can be resumed or aborted.

1. To pause a cycle in progress, press **STOP** on touch screen. Display shows:

   RESUME OR ABORT CYCLE?

2. Press **RESUME CYCLE** on touch screen to resume cycle. Cycle resumes at beginning of phase where cycle was interrupted.

4.11 Abort a Cycle

If cycle needs to be aborted for any reason, proceed as follows:

1. Press **STOP** on touch screen. Display shows:

   RESUME OR ABORT CYCLE?

2. Press **ABORT** on touch screen.

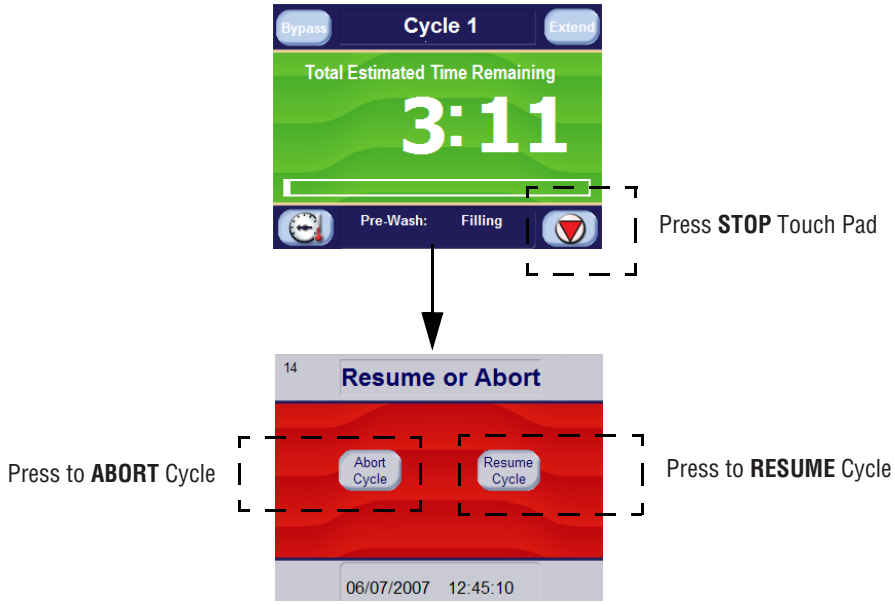


Figure 4-5. Resume or Abort a Cycle

4.12 Shutdown

There is no Shutdown mode on the **Basil 4700 Cage and Rack Washer**. Washer should remain **ON** at all times except when performing maintenance or repairs, then operator needs to lockout/tagout main electrical disconnect switch to **OFF** position.

4.13 Power Failure

If a power failure occurs, when power is restored, turn LOCK/UNLOCK/INIT key switch to **INIT** position, control goes to Mode Selection screen. If an accessory rack was in process, cycle should be restarted from the beginning.

CYCLE AND CONTROL VALUE PROGRAMMING 5

IMPORTANT: *A listing of the Safety Precautions to be observed when operating this Cage and Rack Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.*

5.1 General

PLC control of **Basil® 4700 Cage and Rack Washer** allows adjustment of previously programmed cycles to process different types of loads.

Twelve cycles (CYCLES 1 to 12) are available for operator custom-programming of special cycles. Desired cycles values must be properly set to process accessory racks accordingly.

Cycles include various sequences of phases.

*NOTE: See **Table 5-1**, Cycle Description Chart, for phase specifications.*

Table 5-1. Cycle Description Chart - Basil 4700 Cage and Bottle Washer

	PRE-WASH		ALKALINE WASH		ACID WASH (OPTION)		ACID SOAK (OPTION)		RINSE 1		RINSE 2		FINAL RINSE		EXHAUST	
PHASE:	RECIRCULATED		RECIRCULATED		RECIRCULATED				RECIRCULATED		RECIRCULATED		RECIRCULATED			
CIRCULATION [1] TIME:	DEFAULT 01:00	SELECT 00:00 TO 99:99	DEFAULT 05:00	SELECT 00:00 TO 49:99	DEFAULT 05:00	SELECT 00:00 TO 49:99	DEFAULT 01:30	SELECT 00:00 TO 99:99	DEFAULT 01:30	SELECT 00:00 TO 49:99	DEFAULT 01:30	SELECT 00:00 TO 49:99	DEFAULT 01:30	SELECT 00:00 TO 49:99	DEFAULT 01:30	SELECT 00:00 TO 99:99
INJECTION PUMP SELECTION:			**ALKALINE DETERGENT PUMP**		**ACID DETERGENT PUMP**											
WATER TYPE OR AIR TEMP	HTW		HEATED 140.0°F (60°C)	HEATED 70.0F (21.1°C) TO 185°F (85°C)	HEATED 140.0°F (60°C)	HEATED 70.0F (21.1°C) TO 185°F (85°C)			HEATED 180.0°F (82.2°C)	HEATED 70.0F (21.1°C) TO 185°F (85°C)	HEATED 180.0°F (82.2°C)	HEATED 70.0F (21.1°C) TO 185°F (85°C)	HEATED 180.0°F (82.2°C)	HEATED 70.0F (21.1°C) TO 185°F (85°C)		

CYCLE 1	X	X	X	X	X	X	X	X
CYCLE 2	X	X	X	X	X	X	X	X
CYCLE 3	X	X	X	X	X	X	X	X
CYCLE 4	X	X	X	X	X	X	X	X
CYCLE 5	X	X	X	X	X	X	X	X
CYCLE 6	X	X	X	X	X	X	X	X
CYCLE 7	X	X	X	X	X	X	X	X
CYCLE 8	X	X	X	X	X	X	X	X
CYCLE 9	X	X	X	X	X	X	X	X
CYCLE 10	X	X	X	X	X	X	X	X
CYCLE 11	X	X	X	X	X	X	X	X
CYCLE 12	X	X	X	X	X	X	X	X

DEFAULT VALUES NOT SHOWN ON CHART (ADJUSTABLE IN SERVICE MODE ONLY)

SUMP FILL ALARM TIME:		300 (60-6000)	PH MONITORING LIMITS	LOW	06 Ph (01-14 Ph)	NUMBER OF CHEMICAL PUMPS		3 (02 TO 04)
SUMP DRAIN ALARM TIME:		60 (01-6000)		HIGH	09 Ph (01-14 Ph)	COMPLETE CYCLE ALARM TIME		60 (01-6000)
SUMP HEATING ALARM:		600 (60-3000)	PH MIXING TIME		45 (01-99)	DETERGENT MONITORING		180 (01-6000)
ALKALINE NEUTRALIZER	INJECT:	5 (02-99)	PH NUMBER OF TRIES		9 (03 TO 15	DETERGENT INJECTION (CONDUCTIVITY)		500 (100-40000
	WAIT:	45 (30-99)	ALKALINE CONTAINEMENT INJ. TIME		2 (01-98)	DETERGENT INJECTION (TIME BASED)		10 (0-999
ACID NEUTRALIZER	INJECT:	10 (02-99)	ACID CONTAINEMENT INJ. TIME		6 (01-98			
	WAIT:	45 (30-99)						

X RECOMMENDED

NOT APPLICABLE

VALUES ADJUSTABLE BY THE OPERATOR IN AUTOMATIC MODE

CTW= COLD TAP WATER
HTW= HOT TAP WATER

RESERVICE IN 100 DAYS
RESERVICE IN 1000 CYCLES
CYCLE COUNT: 00000001 (TYPICAL)

5.2 Supervisor Mode

Supervisor mode access is secured by a password.

5.2.1 Supervisor Mode Menus

Supervisor mode includes the following menus:

- **Set Date** – to set washer date
- **Set Date Format** – to select date format (YYYY/MM/DD, MM/DD/YYYY or DD/MM/YYYY
- **Set Time** – to set washer time
- **Set Temperature Format** – to select temperature units (Celsius or Fahrenheit)
- **Modify Cycles** (see *SECTION 5.3, CYCLES MENU*) – to create customized cycles and modify customized and preprogrammed cycles:
    - To modify cycles name, icon
    - To modify cycles phases parameters
    - To reset cycle default parameters
- **Printer** – to enable or disable printer

5.2.2 Accessing Supervisor Mode

To access Supervisor mode, proceed as follows:

1. On Mode Selection screen, press **OPTIONS** touch pad.
2. On Options screen, press **SUPERVISOR MODE** touch pad.
3. On Numeric keyboard, enter appropriate password (supervisor and service user can access Supervisor Mode).
4. Press **OK** touch pad.

   NOTE: If password entered is wrong, display shows: USERNAME OR PASSWORD NOT RECOGNIZED, PLEASE TRY AGAIN.

5.3 Cycles Menu

Cycles menu is used for modifying cycles.

Cycle modifications include phases, phases parameters, cycle name, etc.

See **Table 5-1**, *Cycle Description Chart,* for treatments and values available.

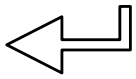
NOTE: While scrolling through screens and menus, note the following:

1) *Refer to SECTION 3.2.5, OPERATOR TERMINAL TOUCH SCREEN, for complete touch pads description.*
2) *Press **X** on touch screen to cancel modification and return to previous level screen.*
3) *Press **OK** on touch screen to save the modification and return to previous level screen (OK button is only present on the last menu, press right arrow to reach the last menu).*

- **Modifying a Cycle**

To modify a preprogrammed or customized cycle, proceed as follows:

1. Access Supervisor mode as explained in *SECTION 5.2.2, ACCESSING SUPERVISOR MODE*. Display shows Supervisor Mode screen:
2. Press Modify Cycles on touch screen. Display shows Cycles screen:
3. Select and press appropriate cycle to modify. Display shows Change Cycle screen.



- **Change Name** – to change cycle name use touch pad appearing on screen. Press **ENTER** arrow to return to Change Cycle screen.
- **Change Icon** – Select and press appropriate icon touch pad to change cycle icon. Use **RIGHT** arrow touch pad to advance screen until **OK** touch pad is available to confirm modification and return to Change Cycle screen.
- **Change Parameters** – to change cycle parameters press corresponding touch pad.
  OK touch pad allows saving current treatment parameters. **LEFT** and **RIGHT** arrow touch pads allow scrolling through current treatment parameters.
  Pressing **X** touch pad allows to cancel modification of current treatment and returns to Change Cycle screen.
- **Reset Cycles to Default** – to reset default cycle values.

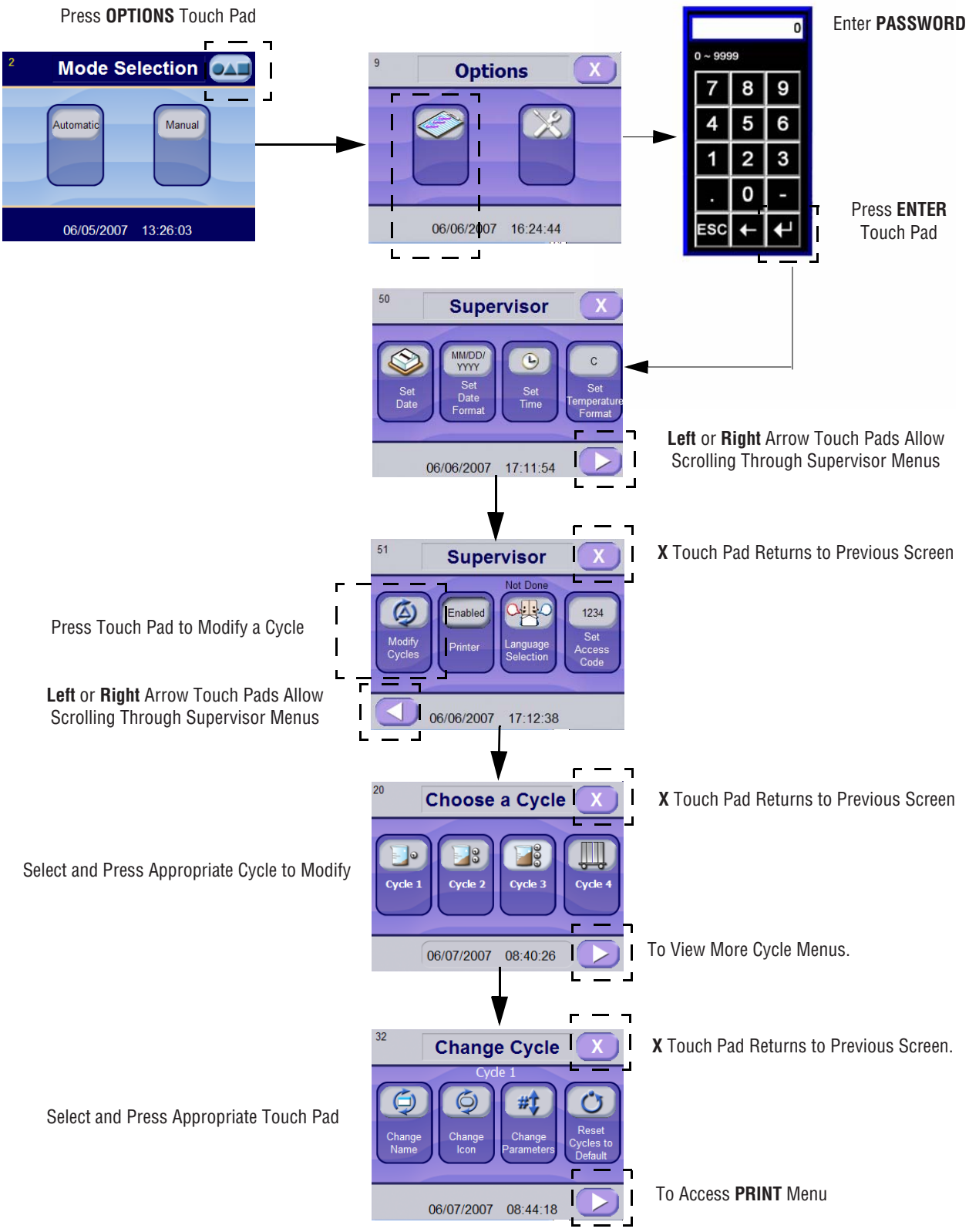


Figure 5-1. Supervisor Mode Flowchart

ROUTINE MAINTENANCE

6

IMPORTANT: *A listing of the Safety Precautions to be observed when operating this Cage and Rack Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.*

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:

- **Regularly scheduled preventive maintenance, in addition to faithful performance of minor maintenance described in this manual, is required for safe and reliable operation of this equipment. Contact STERIS to schedule preventive maintenance.**
- **Only STERIS or STERIS-trained service personnel should make repairs or adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel or installation of unauthorized parts could cause personal injury, invalidate warranty or result in costly damage. Contact STERIS regarding service options.**

WARNING – ELECTRIC SHOCK HAZARD: Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

Procedures described in this section must be performed at regular intervals indicated. Indicated frequencies are minimums and should be increased with increased use of equipment. If a problem occurs, refer to *SECTION 7, TROUBLESHOOTING*. A sample preventive maintenance schedule is included in this section. Use sample schedule as a guide to establish a facility preventive maintenance record for your washer.

Close attention should be paid to conditions in operating environment which will affect frequency of some maintenance procedures indicated (e.g., mineral content of water supply, washer usage).

WARNING – BURN HAZARD: Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.

6.1 Preventive Maintenance Schedule

The following guide should be used to properly maintain washer. These procedures should be carried out only by qualified service technicians. Certain procedures need to be completed by STERIS, noted by a star (*), contact STERIS when service is required. Preventive maintenance is not covered under warranty.

Table 6-1. Preventive Maintenance Guide

Recommended frequency of inspection is monthly. Usage and utility conditions may require more or less inspections. Tasks are defined on a yearly basis.	Frequency
1.0 PREPARATION FOR PREVENTIVE MAINTENANCE	
1.1 Discuss equipment with department personnel.	12 x/yr
1.2 Inspect printouts for signs of trouble.	12 x/yr
1.3 If required, install test equipment.	12 x/yr
1.4 When necessary, shut off all building services and drain all lines.	12 x/yr
1.5 Before servicing equipment, use Lockout-Tagout practices. Always follow local occupational health and safety regulations as well as electric and plumbing codes.	Every Inspection
1.6 Verify equipment disconnect device is within easy reach and accessible to operator at all times.	Every Inspection
2.0 PLC CONTROL AND PRINTER	
2.1 Inspect printer for proper operation.	6 x/yr
2.2 Replace printer as required.*	A/R
2.3 Verify paper takeup is working properly.	6 x/yr
2.4 Check printout for darkness, missing dots, etc.	3 x/yr
2.5 Verify proper date and time are displayed; if not, reset.	6 x/yr
2.6 Inspect touch screens for proper operation.	3 x/yr
2.7 Calibrate conductivity and pH set points.*	4 x/yr
2.8 Replace PLC battery as required.*	A/R
3.0 DOOR ASSEMBLIES	
3.1 Observe door(s) for ease of operation.	12 x/yr
3.2 Inspect condition for door gasket for wear - Replace if necessary.*	12 x/yr
3.3 Verify operation of door safety switch(es) - Adjust if necessary.*	4 x/yr
3.4 Verify operation of interlock system. Adjust if necessary.	1 X/yr
4.0 CHAMBER COMPONENTS	
4.1 Verify sump under floor sections for debris - Use a hose to clean if necessary.	12 x/yr
4.2 Inspect water level float ball - Clean as necessary.	12 x/yr

Table 6-1. Preventive Maintenance Guide (Cont'd)

Recommended frequency of inspection is monthly. Usage and utility conditions may require more or less inspections. Tasks are defined on a yearly basis.	Frequency
4.3 Verify proper water level in sump - Clean if necessary.	6 x/yr
4.4 Remove hard water deposits from sump, chamber interior and accessories.	6 x/yr
4.5 Verify piping for leaks - Repair if necessary.*	12 x/yr
4.6 Inspect condition of washer accessories.	12 x/yr
4.7 Verify interior light - Replace if necessary.	12 x/yr
4.8 Verify pump suction strainer for debris - Clean if necessary.	12 x/yr
4.9 If option is present, verify connection between riser valve and feeder bottle cart is secure.	12 x/yr
5.0 CARRIAGE SYSTEM	
5.1 Inspect spray jets - Align and clean as necessary.	12 x/yr
5.2 Inspect spray header - Flush out as necessary.	12 x/yr
5.3 Inspect oscillating carriage drive and clutch system. Test clutch for slippage - Adjust if necessary.*	12 x/yr
5.4 Verify header rollers for wear - Replace if necessary.*	12 x/yr
6.0 EACH SUPPLY-LINE STRAINER	
6.1 Inspect strainer for debris - Clean as necessary.	4 x/yr
7.0 EACH STEAM TRAP	
7.1 Inspect steam trap for proper operation.*	12 x/yr
7.2 Rebuild steam trap as required.*	A/R
8.0 EACH VALVE	
8.1 Inspect each valve - Clean if necessary.	4 x/yr
8.2 Inspect each solenoid valve for proper operation - Replace if necessary.*	4 x/yr
8.3 Rebuild each solenoid valve based on history unit failure.*	2 x/yr
8.4 Inspect valves - Clean or replace if necessary.	4 x/yr
9.0 PUMP MOTOR	
9.1 Inspect pump seal for leakage - Replace if necessary.*	6 x/yr
9.2 Verify for proper pump rotation.*	12 x/yr
9.3 Verify for noise and vibration.*	12 x/yr
9.4 Grease pump motor bearings where applicable.	2 x/yr
10.0 SELF-CLEANNING SCREEN	
10.1 Inspect self-cleaning screen - Disassemble and remove debris from screen as necessary.	12 x/yr

Table 6-1. Preventive Maintenance Guide (Cont'd)

Recommended frequency of inspection is monthly. Usage and utility conditions may require more or less inspections. Tasks are defined on a yearly basis.	Frequency
11.0 ELECTRICAL CONTROL BOX	
11.1 Verify all sockets for proper seating of electrical components.*	12 x/yr
11.2 Inspect wiring, terminals and socket connections for damage or fraying.*	12 x/yr
12.0 AUTOMATIC DETERGENT INJECTION SYSTEM	
12.1 Inspect and lubricate detergent supply and injection hose - Replace if necessary.	12 x/yr
12.2 Lubricate chemical injection pump rollers.	12 x/yr
12.3 Verify pickup tubes screen for debris - Clean as necessary.*	12 x/yr
12.4 Verify amount of detergent injected.	12 x/yr
13.0 OPTIONAL EXHAUST FAN	
13.1 Grease fan bearings in two locations.	6 x/yr
14.0 SAFETY FEATURES	
14.1 Verify warning plates inside wash chamber for legibility. If worn out, broken or no longer legible, replace with new ones.	12 x/yr
14.2 Test Emergency Stop cables for proper operation.	12 x/yr
15.0 FINAL TEST	
15.1 Clean lint and dirt from components.	12 x/yr
15.2 Run unit through two cycles to verify proper operation - Verify all displays and printouts.	12 x/yr
15.3 Remove all test equipment installed for inspection.	12 x/yr
15.4 Install any panel or cover removed during inspection.	12 x/yr
15.5 Inspect work area and washer to ensure removal of all materials used during inspection.	12 x/yr

6.2 Daily Cleaning Procedures

WARNING – PERSONAL INJURY HAZARD:

- **Always wear appropriate Personal Protective Equipment (PPE) when cleaning or removing debris from bottom of wash chamber and over suction plate.**
- **Never perform cleaning of wash chamber until full cycle has been completed. If cycle has not been completed, contaminated debris or water may remain in the bottom of the wash chamber.**

WARNING – ELECTRIC SHOCK HAZARD: Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

WARNING – BURN HAZARD: Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.

1. After last cycle of day, allow unit to cool, turn LOCK/UNLOCK/INIT key switch to **LOCK** position. Remove key from selector and keep it on yourself; wearing appropriate Personal Protective Equipment (PPE) enter wash chamber and then remove and clean suction pump strainer as follows:
   a. Remove floor gratings in wash chamber.
   b. Loosen hose clamps and pull strainer straight out.
   c. Rinse strainer under a forceful stream of water to remove all soil and debris. Always clean filters while still wet before foreign matter dries.
   d. Replace suction pump strainer in chamber sump and tighten hose clamps.
2. Remove riser valve and inspect for debris. Brush off and rinse under tap water if necessary.

6.3 Weekly Cleaning Procedures

6.3.1 Clean Washer Exterior

WARNING – ELECTRIC SHOCK HAZARD: Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

CAUTION – POSSIBLE EQUIPMENT DAMAGE: Use nonabrasive cleaners when cleaning unit. Follow directions on containers and rub in a back-and-forth motion (in same direction as surface grain). Abrasive cleaners will damage stainless steel. Cleaners rubbed in a circular motion applied with a wire brush or steel wool will scratch and dull stainless steel. Do not use these cleaners on painted surfaces.

Clean washer exterior with a general purpose cleaner to remove general stains, a stainless-steel stain remover for stubborn stains, and a stainless-steel polish to keep equipment looking new.

1. Using a damp cloth or sponge, apply cleaner in a back-and-forth motion, in same direction as surface grain.
2. Thoroughly wipe off cleaner.
3. Polish surface with a clean, dry and lint-free cloth.
4. Clean door windows, with a general window cleaning product.
5. Dry window with a lint-free cloth.

6.3.2 Clean Washer Interior

WARNING – BURN HAZARD: Never perform cleaning of wash chamber until full cycle has been completed. If cycle has not been completed contaminated debris or water may remain in the bottom of the wash chamber.

After last cycle of day, allow unit to cool, turn LOCK/UNLOCK/INIT key switch to **LOCK** position. Remove key from selector and keep it on yourself; wearing appropriate Personal Protective Equipment (PPE), enter wash chamber and proceed as follows:

1. Wash chamber with a mild detergent solution.
2. Rinse with tap water and dry with a lint-free cloth.
3. If interior is stained, use a general purpose cleaner to remove general stains or a stainless-steel remover for stubborn stains, as follows:
   a. Using a damp cloth or sponge, apply cleaner in a back-and-forth motion, in same direction as surface grain.
   b. Thoroughly wipe off cleaner.
   c. Polish surface with a clean, dry, lint-free cloth.
   d. Clean door windows with a general window cleaning product.
   e. Dry window with a lint-free cloth.

6.3.3 Clean Spray Jets and Headers

After last cycle of day, allow unit to cool, turn LOCK/UNLOCK/INIT key switch to **LOCK** position. Remove key from selector and keep it on yourself; wearing appropriate Personal Protective Equipment (PPE), enter wash chamber and proceed as follows:

1. Observe jet nozzles during unit operation and inspect each nozzle to detect debris.
2. Insert a wire (smaller diameter than a jet nozzle) into spray nozzles, and push debris through nozzles into header.
3. Remove flush plug from bottom of each spray header (see Figure 6-1).
4. Manually fill sump with water and run pump for 30 seconds to flush loosened debris from spray headers.
5. Replace flush plugs.

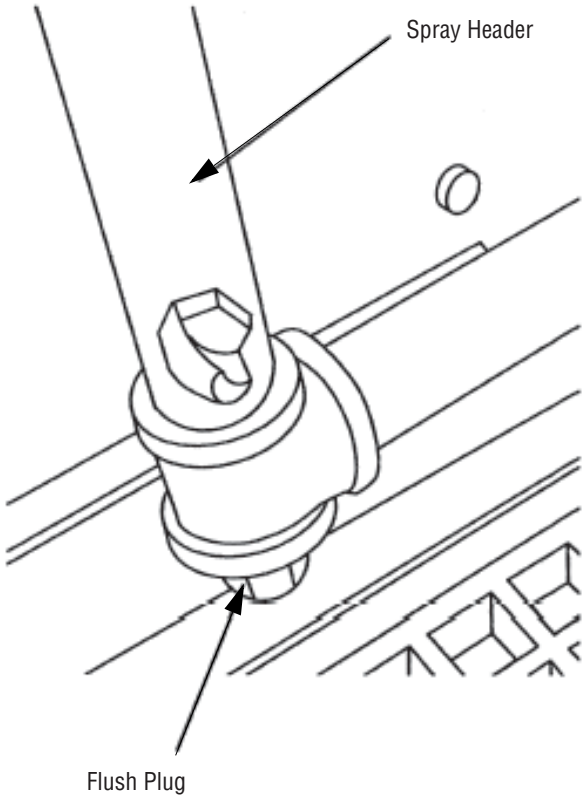


Figure 6-1. Spray Header Flush Plug

6.3.4 Inspect Self-Cleaning Screen

WARNING – ELECTRIC SHOCK HAZARD: Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

WARNING – BURN HAZARD:

- **Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.**
- **Pipes may be extremely hot.**

NOTE: A STERIS or STERIS-trained service technician is required to perform this task. Contact STERIS for this service. Preventive maintenance is not covered under warranty.

IMPORTANT: *Intake filter requires periodic inspection and replacement. Initial inspection is suggested once a week; user should determine frequency thereafter.*

1. Lock disconnect switch in OFF position and close building supply valves.
2. Allow unit to cool down.
3. Remove quick disconnect clamps located directly on filter assembly (see Figure 6-2).
4. Remove filter cartridge by pulling straight out on handle.
5. Brush and rinse surface of filter cartridge to remove any debris. Inspect O-ring for damage.
6. Rinse filter under running water.
7. Reinsert filter cartridge. Reposition gaskets, quick disconnect clamps and tighten.

   NOTE: Gasket should last for several inspection procedures. When necessary, order replacement gasket (P117951-568 and P117951-392) from STERIS.
8. Re-energize washer utilities.

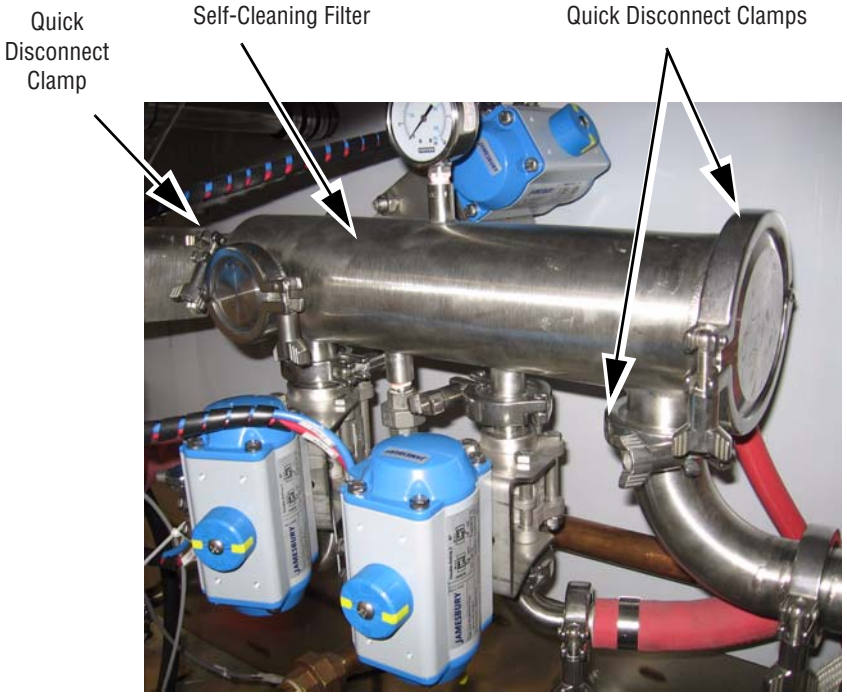


Figure 6-2. Self-Cleaning Screen

6.4 Monthly Cleaning Procedures: Remove Hard Water Deposits from Chamber and Accessories

WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Wear gloves and eye protection when using a descaling product. Avoid contact with eyes or skin. If spilled or splashed, flush with plenty of water for 15 minutes. If swallowed, DO NOT induce vomiting. Administer an alkali with plenty of water. Seek medical attention immediately.

WARNING – SLIPPING HAZARD: To prevent slips, keep floor dry. Promptly clean up any spills or condensation. If spilled liquids are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

NOTE: Depending on hardness of water being used, it may be necessary to remove hard water deposits more often. Remove deposits from chamber and material handling accessories whenever deposits become visible.

1. Open chamber door. If desired, place empty wash cart(s) and accessories in chamber.
2. Turn **OFF** detergent supply pump (optional or by others).
3. Pour 1 gal (3.8 L) of descaling liquid into chamber sump. Exit chamber and close door.
4. Press **MANUAL** touch pad to access Manual Control mode.
5. Select and start PUMP & DRIVE function.
6. Let washer run for 15 minutes, then press **PUMP & DRIVE** touch pad.
7. Once hard water deposits are removed, select and start DRAIN function to drain descaler solution from sump.
8. Manually fill and drain chamber sump again to remove any residue.
9. Press **X** touch pad to exit Manual Control mode and turn **ON** detergent pump.

6.5 Routine Maintenance

6.5.1 Grease Exhaust Fan Bearings

WARNING – ELECTRIC SHOCK HAZARD: Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

WARNING – BURN HAZARD:

- **Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.**
- **Pipes may be extremely hot.**

Exhaust fan bearings must be greased once a week as follows:

1. Locate remote exhaust fan grease fittings (see Figure 6-3).
2. Apply a high temperature, water-resistant grease (P117951-457).

NOTE: If a standard temperature grease is used, fan bearings must be greased once at end of each day.

Figure 6-3. Exhaust Fan Grease Fittings

6.5.2 Clean Side Tanks

WARNING – ELECTRIC SHOCK HAZARD: Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Washer detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin or attempt to swallow. Read and follow precautions and instructions on detergent label and in Material Safety Data Sheet (MSDS) prior to handling detergent, refilling detergent container, or servicing detergent injection pump or lines. Wear appropriate Personal Protective Equipment (PPE) whenever handling detergent or servicing detergent injection pump and lines.

WARNING – BURN HAZARD:

- **Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.**
- **Pipes may be extremely hot.**

Side tanks must be cleaned once every two months using Manual Control mode as follows:

1. Press **MANUAL** touch pad to access Manual Control mode and display menu of available manual functions.
2. Press **DRAIN** touch pad to select DRAIN function.
3. A menu screen appears listing chamber sump and other washer tanks which may be drained using this function.
4. Press **ALKALINE TANK** or **ACID TANK** touch pad to begin draining corresponding tank.
5. Allow tank to drain.
6. Lock disconnect switch in OFF position and close building supply valves.
7. Open manual drain valve (see Figure 6-4) to allow any remaining liquids to drain.
8. Lift off tank cover and flush out tank by spraying inside of tank with a hose. Allow tank to drain and replace tank cover.
9. Close drain valve.
10. Repeat procedure for each tank.
11. Re-energize washer utilities.

- **Side tank with guaranteed temperature (option):**

Partially drain side tank using Manual Control mode as follows:

1. Press **MANUAL** touch pad to access Manual Control mode.
2. Press **DRAIN** touch pad function.
3. A menu screen appears listing chamber sump and other washer tanks which may be drained using this function.
4. Press **COOLDOWN** touch pad to begin draining cooldown (drain discharge) tank.
5. Allow tank to partially drain, then press **COOLDOWN** touch pad to stop cooldown tank draining.
6. Lock disconnect switch in **OFF** position and close building supply valves.
7. Lift off cover and flush out tank spraying inside of tank with a hose.
8. Replace tank cover and re-energize washer utilities.
9. Resume draining side tank.
10. When draining is complete, screen returns to drain menu.
11. Press **X** touch pad to return screen to manual function menu.
12. Press **X** touch pad to return to Mode Selection screen.

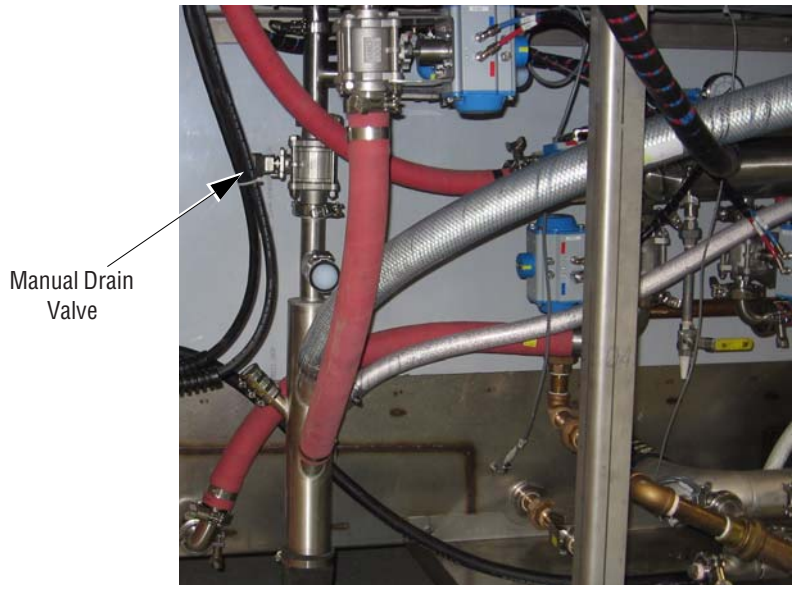


Figure 6-4. Manual Drain Valve

6.5.3 Clean Drain Discharge Temperature Control Probe

WARNING – ELECTRIC SHOCK HAZARD: Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

WARNING – BURN HAZARD:

- **Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.**
- **Pipes may be extremely hot.**

Temperature control probe must be cleaned once every month as follows:

1. Drain discharge side tank using Manual Control mode.
2. Lock disconnect switch in OFF position and close building supply valves.
3. Locate temperature control probe along side of discharge tank.
4. Loosen compression fitting nut and remove probe from discharge tank.
5. Using a rag dampened with acid or descaler, remove hard water deposits and debris from probe.
6. Reinstall probe and tighten compression fitting nut.
7. Re-energize washer utilities.

WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Wear gloves and eye protection when using a descaling product. Avoid contact with eyes or skin. If spilled or splashed, flush with plenty of water for 15 minutes. If swallowed, DO NOT induce vomiting. Administer an alkali with plenty of water. Seek medical attention immediately.

6.5.4 Replace Detergent Squeeze Tube

WARNING – ELECTRIC SHOCK HAZARD: Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

WARNING – BURN HAZARD:

- **Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.**
- **Pipes may be extremely hot.**

Replace detergent squeeze tube as follows:

1. Lock disconnect switch in OFF position and close building supply valves.
2. Locate detergent supply pump.
3. Remove clamps and disconnect supply and injection hoses from squeeze tube (see Figure 6-5).
4. Remove screws from pump cover and lift off pump cover.
5. Grasp one end of squeeze tube and pull tube out of pump. Discard tube.
6. Clean all pump surfaces.
7. Lubricate new squeeze tube (P117950-583). Liberally apply lubricant (P117950-599) over tube surface to within 2" [51 mm] of each end.
8. Insert one end of squeeze tube into pump. Feed tube through pump by manually rotating roller block.
9. Spread lubricant over rollers in roller block.
10. Replace pump cover and fasten with screws previously removed.
11. Connect supply and injection hoses to ends of squeeze tube and attach clamps.
12. Re-energize washer utilities.

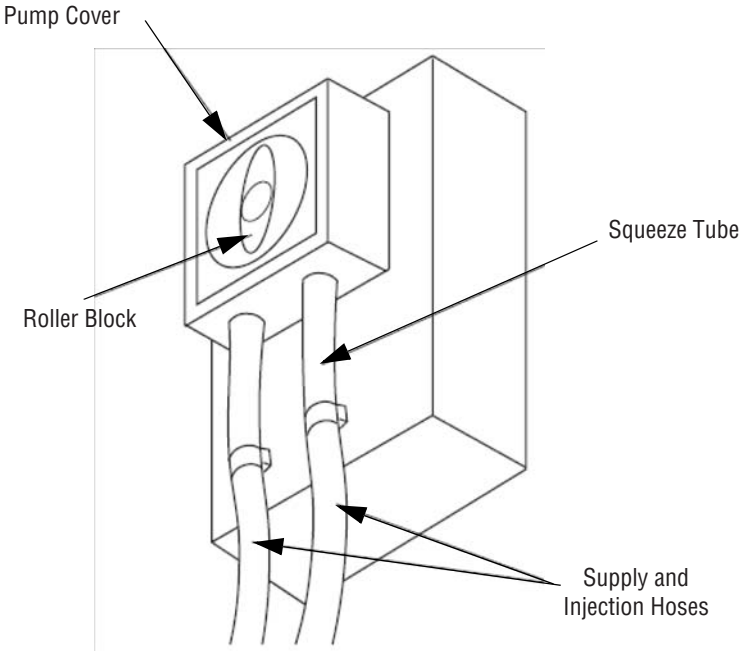


Figure 6-5. Detergent Supply Pump

6.5.5 Replacing Detergent Container

WARNING – ELECTRIC SHOCK HAZARD: Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local occupational health and safety regulations, as well as electric and plumbing codes.

WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Washer detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin or attempt to swallow. Read and follow precautions and instructions on detergent label and in Material Safety Data Sheet (MSDS) prior to handling detergent, refilling detergent container, or servicing detergent injection pump or lines. Wear appropriate Personal Protective Equipment (PPE) whenever handling detergent or servicing detergent injection pump and lines.

CAUTION – POSSIBLE EQUIPMENT DAMAGE:

- **When choosing a detergent, select one with a low chloride content. Detergents with a high chloride content can corrode stainless steel.**
- **Always use non-foaming chemical for effective cleaning and proper pump and water level control operation. Follow manufacturer's recommendations for amount of chemical to be used.**

To achieve maximum cleaning efficiency, select a chemical appropriate to soil type being processed. Refer to *SECTION 2.3, CHEMICAL ADDITIVES SPECIFICATIONS*, and always follow chemical manufacturer's recommendations for amount of chemical to be used.

NOTE: Always use a non-foaming chemical for effective cleaning and proper pump operation.

When chemical is low or has run out:

1. Remove pickup tube and level sensor assembly from empty container and remove container.
2. Install a new container.
3. Insert pickup tube and level sensor vertically into new container.

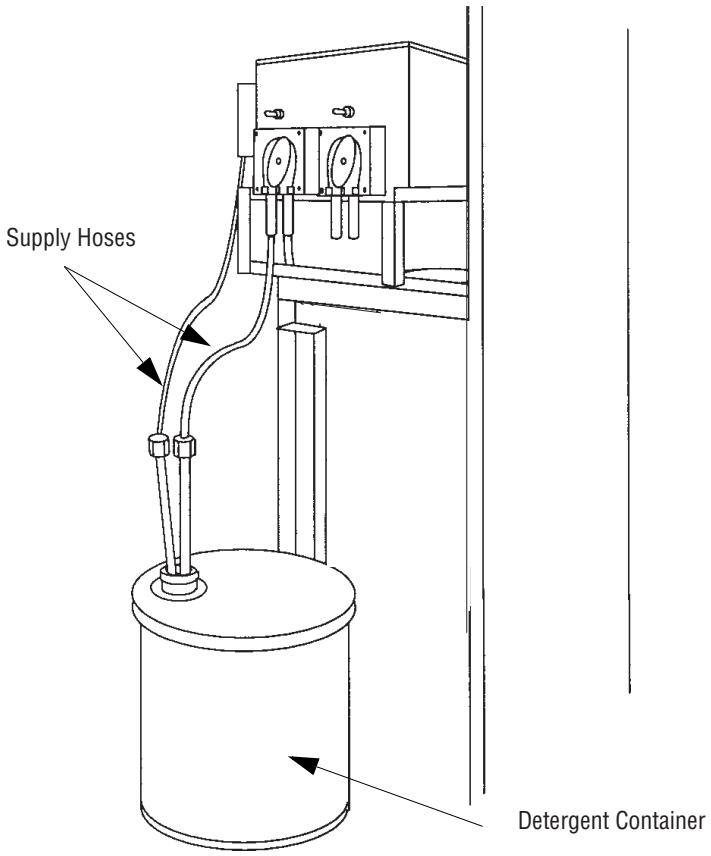


Figure 6-6. Replacing Detergent Container

WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Wear appropriate Personal Protective Equipment (PPE) when removing clamps and replacing squeeze tubes. Residual chemicals might remain in used squeeze tubes. If chemical contacts skin or eyes, immediately flush with running water for at least 10 minutes. If contact was with eyes, seek medical attention.

6.6 Printer Paper Roll Replacement

1. Press on the dots on printer cover to release latch; pull cover out towards you to completely disengage cover; and then gently swing it down 180° until it rests against equipment panel (see Figure 6-7).
2. Press on the indentation on the right side-wall of paper cover, gently pull to release, and swing door to the left until it is open (see Figure 6-8).
3. Cut leading edge of paper roll straight and square with the sides as shown on Figure 6-9.
4. Mount paper roll on paper-roll-holder, two plastic protrusions shaped like domes, inside paper compartment. Paper must curl up as shown (see Figure 6-10). Paper roll core must properly align with paper-roll-holder. Make sure paper-roll-holder fits inside paper core and paper roll can turn freely.
5. Hold both edges of paper and insert it straight into paper slot of printer mechanism. Printer feeds paper automatically.
6. Press FEED Button to get desired length of paper fed through mechanism. Do not pull paper in either direction through printer mechanism.
7. Remove take-up spool and insert leading edge of paper into slit on its shaft. Wrap paper around spool two or three times tightly and install take-up spool in printer. First make sure that gear on take-up spool aligns with gear on printer and then press the other end of shaft so it snaps in on metal frame.
8. Close paper cover and then close front cover.

NOTE: When changing paper roll, note the following:

1 Use a paper that meets printer specifications.

2 Do not use a paper that is glued to core.

3 Do not fold leading edge of paper when you use a new roll.

4) Do not operate the printer without paper or ribbon; this leads to rapid deterioration of the print head.

5) Do not use any sharp object to remove paper jams.

6) Do not pull on the paper while the printer is printing.

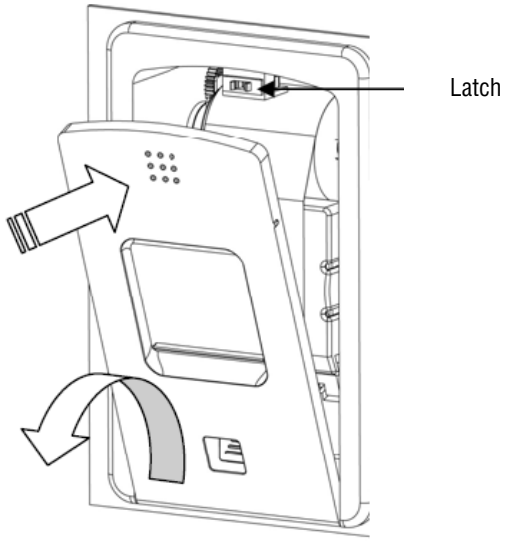


Figure 6-7. Open Printer Cover

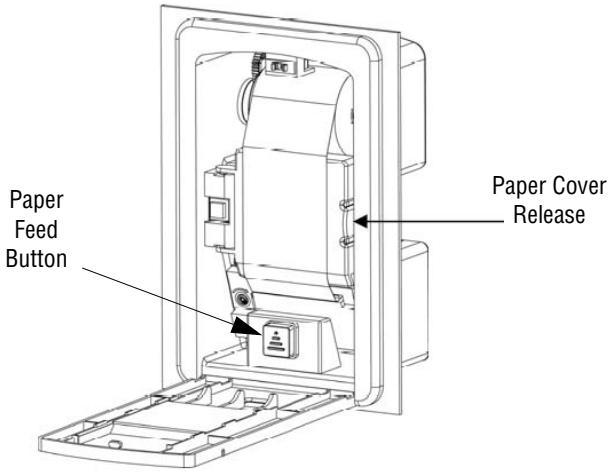


Figure 6-8. Open Paper Cover Compartment

Figure 6-9. Cut Paper Edge

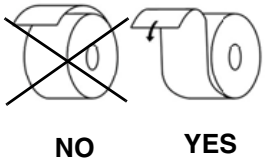


Figure 6-10. Install Paper Roll

6.7 Changing Printer Ribbon Cartridge

NOTE: When changing ribbon cartridge, note the following:

1) Ensure the power is turned off when replacing the ribbon cartridge.

2) Replace the ribbon cartridge before it is completely worn out and dry.

1. Open printer front cover.
2. Remove paper from inside printer. Do not pull paper out. Use a pair of scissors to cut paper, where it feeds inside mechanism and use Paper Feed Button to remove remaining paper in printer.
3. Remove old cartridge by pressing cartridge, where marked PUSH, on right side.
4. Turn Ink Cartridge Knob in direction of arrow, to take up any slack in ribbon.
5. Place new cartridge on mechanism so ribbon aligns between print head and platen. Push down until it clicks in.
6. Turn Ink Cartridge Knob in direction of arrow a few times to take up any slack and ensure ribbon is installed properly without wrinkles or creases.

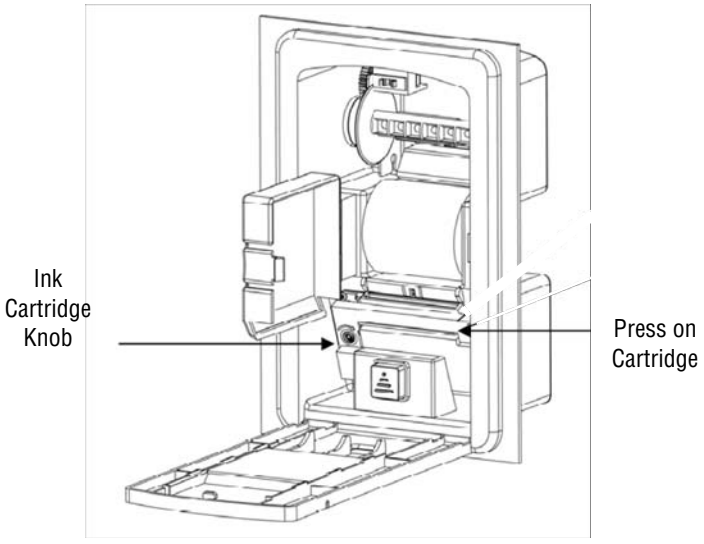


Figure 6-11. Changing Printer Ribbon Cartridge

TROUBLESHOOTING

7

IMPORTANT: *A listing of the Safety Precautions to be observed when operating this Cage and Bottle Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.*

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: Only STERIS or STERIS-trained service technicians should make repairs and adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel, or installation of unauthorized parts could cause personal injury, invalidate warranty, or result in costly damage. Contact STERIS regarding service options.

WARNING – ELECTRIC SHOCK HAZARD: Disconnect all utilities to washer before servicing. Do not service washer unless all utilities have been properly locked out. Always follow local electrical safety - related work practice standards.

WARNING – BURN HAZARD: Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.

This section contains detailed information on types of washer malfunctions likely to occur and possible causes and corrective actions.

If you are unable to correct the problem with use of the following Troubleshooting Charts, or if a problem occurs that is not described on chart, please call STERIS. A factory-trained technician will promptly place your washer in proper working condition. Service charges may be incurred. Consult your warranty for details.

NOTE: Never allow unqualified persons to service washer.

Table Descriptions

Table 7-1 - Troubleshooting Chart - Situations where NO alarm or printout occur.

Table 7-2 - Fault Chart - Faults where alarm and/or printout occur.

Table 7-1. Troubleshooting Chart

PROBLEM	POSSIBLE CAUSE AND CORRECTION
1. No power, screen is blank.	1. Building electrical supply disconnect switch (circuit breaker) is in OFF position – position switch to **ON**. 2. Fuse in power supply failed – call STERIS.* 3. Power supply failed – call STERIS.* 4. Replace display (touch screen) – call STERIS.*
2. Cycle does not start when **START** touch pad is pressed.	1. Chamber door(s) open – close and latch door(s) 2. Hot water supply valve closed – open building and washer supply valves. 3. Faulty door safety switch – call STERIS.* 4. Faulty display (touch screen) – call STERIS.*
3. Doors open once cycle is started.	1. Exhaust dampered too much – adjust automatic damper. 2. Door latch misadjusted – adjust latch.
4. Too much water entering chamber. Water overflowing from drip gutter.	1. Water level malfunctions. Verify operation of water level – clean as necessary. 2. Fill solenoid valve remains open – call STERIS.*
5. Detergent tank overfilling.	1. Water level malfunctions – verify operation of water level. Clean as necessary. 2. Fill solenoid valve remains open – call STERIS.* 3. Drain line clogged – flush out line. 4. Return valve misaligned – call STERIS.*
6. Water leaks from washer.	1. Chamber door(s) not fully closed – close and latch door(s). 2. Door gasket worn or defective – call STERIS.* 3. Window gasket worn or defective – call STERIS.* 4. Spray jets misaligned – call STERIS.* 5. Water level malfunctions – call STERIS.* 6. Too much water entering chamber – refer to Problem # 5. 7. Piping leaks – call STERIS.* 8. Exhaust dampered too much – call STERIS.* 9. Building vent connections inadequate – call STERIS.*

** Service Charges may be incurred. Consult your warranty for details.*

Table 7-1. Troubleshooting Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
7. Vapor escaping under door(s).	1. Exhaust dampered too much – call STERIS.* 2. Optional exhaust system OFF – verify operation of applicable option. 3. Optional exhaust fan rotating in wrong direction – call STERIS.* 4. Building vent connections inadequate – call STERIS.*
8. Pump starts before appropriate sump water level is reached.	1. Verify operation of water level – clean as necessary. 2. If condition reoccurs, call STERIS.*
9. Pump runs with insufficient or no pump pressure.	1. Suction pump strainer clogged – clean strainer. 2. Water level malfunctions – verify operation of water level. Clean or replace as necessary. 3. Water temperature in excess of 195°F (91°C) – lower temperature set point. 4. Self-cleaning screen clogged – remove debris from screen. 5. Loose hose connection on pump suction strainer – call STERIS.* 6. Pump rotating in wrong direction – call STERIS.* 7. Foam in chamber – rinse chamber with cold water and decrease detergent injection rate; call STERIS.* 8. Compression fitting on pump RTD, located in suction pick-up pipe, is leaking air – call STERIS.*
10. Carriage drive system not operating properly.	1. Drive clutch loose – call STERIS.* 2. Spray headers hitting sealing strips covering vertical panel joints – call STERIS. 3. Drive cable loose or broken – call STERIS.*
11. Washer operation stops during cycle.	1. Loose connection in control wiring – call STERIS.* 2. Electrical component failure (e.g. motor starter) – call STERIS.* 3. Control fuse failed – call STERIS.*
12. Foam in chamber.	1. Detergent is foaming – use recommended products. 2. Too much detergent injected during Wash phase – verify injection rate; call STERIS.*

** Service Charges may be incurred. Consult your warranty for details.*

Table 7-1. Troubleshooting Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
13. Chamber does not drain properly. *NOTE: 1 to 2 inches (25 to 50 mm) of water remain in sump after draining.*	1. Self-cleaning screen clogged – remove debris from screen. 2. Drain line plugged – flush out line. 3. Defective drain valve – call STERIS.* 4. Drain time set too short – call STERIS.*
14. Load comes out dirty.	1. Empty detergent container – replace container. 2. Incorrect detergent used – use recommended products. 3. Spray jets clogged – clean jets. 4. Pump suction strainer clogged – clean strainer. 5. Water temperature in excess of 195 °F (91 °C) – lower temperature set point. 6. Self-cleaning screen clogged – remove debris from screen. 7. Loose hose connection on pump suction strainer – tighten hose clamps or replace as necessary. 8. Spray jets misaligned – realign jets toward load surfaces. 9. Pump rotating in wrong direction – call STERIS.*
15. Printing defect appears consistently in the same column.	Debris trapped on print head – dislodge debris by removing paper from printer, inserting a one-inch wide strip of bond type paper under the print head and moving the paper in both linear and circular motions.
16. Unit will not start.	1. Power OFF – turn power ON (3 phase). 2. Hot water supply OFF – turn hot water supply ON. 3. Door switch failure – make sure door (s) is closed completely. 4. Faulty level sensing – clean probes in sump. 5. Blown fuse – call STERIS.*
17. Pump pressure too low.	1. Faulty level sensing – clean water level probes in sump. 2. Temperature in excess of 195°F (91°C) – lower set-point temperature. 3. Self-cleaning screen blocked – remove, clean and reinstall properly. 4. Too much soap – rinse with cold water and decrease usage.

** Service Charges may be incurred. Consult your warranty for details.*

Table 7-1. Troubleshooting Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
18. Pump pressure too high.	1. Self-cleaning screen blocked – remove, clean and reinstall properly. 2. Drain valve clogged – call STERIS.* 3. Spray jets clogged – poke debris into jets, remove plugs located at bottom of spray header, run spray manually, reinstall plugs.
19. Drive not moving.	Spray header jammed – verify inside chamber for obstruction.
20. Unit not reaching guarantee.	1. Steam supply off – turn hot water supply on. 2. Set-point temperature too low – raise set-point temperature. 3. Steam strainer plugged – call STERIS.* 4. Steam valve stuck – call STERIS.* 5. Poor quality steam supply – call STERIS.* 6. Condensate line locked – call STERIS.* 7. Guarantee deactivated – reactivate inside control panel.
21. Unit is overheating.	1. Temperature in excess of 195 °F (91 °C) – lower set-point temperature. 2. Stuck steam valve – call STERIS.* 3. Leaking steam unions – tighten unions. 4. Leaking steam coil – call STERIS.*
22. Sump overfilling.	1. Faulty level sensing – clean water level probes in sump. 2. Filling valve malfunction – call STERIS.*
23. Sump not filling.	1. Hot water supply off – turn hot water supply on. 2. Faulty level sensing – clean probes in sump. 3. Valve malfunction – call STERIS.* 4. Too much soap – rinse with cold water and decrease usage.

** Service Charges may be incurred. Consult your warranty for details.*

Table 7-1. Troubleshooting Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
24. Jets not spraying.	1. Temperature in excess of 195°F (91°C) – Lower set-point temperature. 2. Self-cleaning screen blocked – remove, clean and reinstall properly. 3. Spray jets clogged – poke debris into jets, remove plugs located at bottom of spray header, run spray manually and reinstall plugs. 4. Plugs in spray header missing – Reinstall plugs. 5. Jet ball valve is out of sequence – call STERIS.*
25. Sump not draining properly.	1. Self-cleaning screen blocked - Remove, clean and reinstall properly. 2. Drain valve clogged - call STERIS.* 3. Drain time set too short - call STERIS.* 4. Facility drain plugged - flush out drain line.
26. Unit not cleaning properly.	1. Temperature in excess of 195°F (91°C) – lower set-point temperature. 2. Self-cleaning screen blocked – remove, clean and reinstall properly. 3. Drain valve clogged – call STERIS. 4. Spray jets clogged – Poke debris into jets, remove plugs located at bottom of spray header, run spray manually and reinstall plugs. 5. Spray header jammed – Verify inside chamber for obstruction. 6. Drain time set too short – call STERIS.* 7. Too much soap – rinse with cold water and decrease usage. 8. Plugs in spray header missing – reinstall plugs.

** Service Charges may be incurred. Consult your warranty for details.*

IMPORTANT: *When a problem occurs with the Basil 4700 Cage and Rack Washer, an alarm sounds. Refer to SECTION 4.9, RESPONDING TO A FAULT, on how to respond to faults.*

Table 7-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND CORRECTION
1. Alarm sounds and screen displays: **LOAD DOOR OPEN WHEN PROCESSING** and printer prints: ALARM: HH:SS:MM LOAD DOOR OPEN WHEN PROCESSING	**Load-side door open.** 1. Close and latch door. 2. Press **ACK** touch pad to acknowledge alarm. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. 4. If condition reoccurs, call STERIS.*
2. Alarm sounds and screen displays: **UNLOAD DOOR OPEN WHEN PROCESSING** and printer prints: ALARM: HH:SS:MM UNLOAD DOOR OPEN WHEN PROCESSING	**Unload-side door open.** 1. Close and latch door. 2. Press **ACK** touch pad to acknowledge alarm. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. 4. If condition reoccurs, call STERIS.*
3. Alarm sounds and screen displays: **SUMP TOO LONG TO FILL** and printer prints: ALARM: HH:SS:MM SUMP TOO LONG TO FILL	**Supply valves not fully open.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Open building and washer supply valves. 3. Foam in chamber – rinse chamber with cold water and decrease detergent injection rate. 4. If condition reoccurs, call STERIS.*
4. Alarm sounds and screen displays: **SUMP TOO LONG TO DRAIN** and printer prints: ALARM: HH:SS:MM SUMP TOO LONG TO DRAIN	**Sump is not drained during allowed time.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Remove debris from sump screen and clean self-cleaning screen. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. 4. If condition reoccurs, call STERIS.*

** Service Charges may be incurred. Consult your warranty for details.*

Table 7-2. Fault Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
5. Alarm sounds and screen displays: **SUMP RTD FAILURE** and printer prints: ALARM: HH:SS:MM SUMP RTD FAILURE	**Faulty RTD sensor in chamber sump.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Clean sump RTD sensor as necessary. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. 4. If condition reoccurs, call STERIS.*
6. Alarm sounds and screen displays: **SUMP FAILED TO REACH TEMPERATURE** and printer prints: ALARM: HH:SS:MM SUMP FAILED TO REACH TEMPERATURE	**Steam supply valve not fully open.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Open building and washer supply valves. 3. Temperature set too high – decrease programmed temperature set point. 4. Poor electrical connection between sump RTD sensor and control – call STERIS.* 5. Low dynamic steam pressure – call STERIS.* 6. Faulty RTD sensor in chamber sump – call STERIS.* 7. Press **RESUME CYCLE** touch pad to resume cycle operation. 8. If condition reoccurs, call STERIS.*
7. Alarm sounds and screen displays: **ALK. TANK TOO LONG TO FILL** and printer prints: ALARM: HH:SS:MM ALK. TANK TOO LONG TO FILL	**Hot water supply valve closed.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Open building and washer supply valves. 3. Manual drain valve open – close valve. 4. Water level float ball malfunctions – verify operation of ball float. Clean as necessary. 5. Building water supply pressure too low – increase supply pressure. 6. Press **RESUME CYCLE** touch pad to resume cycle operation. 7. If situation reoccurs, call STERIS*.

** Service Charges may be incurred. Consult your warranty for details.*

Table 7-2. Fault Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
8. Alarm sounds and screen displays: **ALK. TANK** **TOO LONG TO DRAIN** and printer prints: ALARM: HH:SS:MM ALK. TANK TOO LONG TO DRAIN	1. Press **ACK** touch pad to acknowledge alarm. 2. Transfer valve closed – call STERIS.* 3. Floor drain obstructed – flush out line. 4. Press **RESUME CYCLE** touch pad to resume cycle operation. 5. If condition reoccurs, call STERIS.*
9. Alarm sounds and screen displays: **ALK. TANK** **RTD FAILURE** and printer prints: ALARM: HH:SS:MM ALK. TANK RTD FAILURE	**Faulty RTD sensor in detergent tank.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Clean RTD as necessary. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. 4. If situation reoccurs, call STERIS.*
10. Alarm sounds and screen displays: **ALK. TANK** **FAILED TO REACH TEMP** and printer prints: ALARM: HH:SS:MM ALK. TANK FAILED TO REACH TEMP	1. Press **ACK** touch pad to acknowledge alarm. 2. Steam supply valve not fully open – open building and washer supply valves. 3. Temperature set too high – decrease programmed temperature set point. 4. Fill water temperature too low – increase temperature of building water supply. 5. Faulty RTD sensor in detergent tank – clean as necessary. 6. Press **RESUME CYCLE** touch pad to resume cycle operation. 7. If situation reoccurs, call STERIS.*
11. Alarm sounds and screen displays: **ACID TANK** **TOO LONG TO FILL** and printer prints: ALARM: HH:SS:MM ACID TANK TOO LONG TO FILL	1. Press **ACK** touch pad to acknowledge alarm. 2. Hot water supply valve closed – open building and washer supply valves. 3. Manual drain valve open – close valve. 4. Water level float ball malfunctions – call STERIS.* 5. Press **RESUME CYCLE** touch pad to resume cycle operation. 6. If situation reoccurs, call STERIS.*

** Service Charges may be incurred. Consult your warranty for details.*

Table 7-2. Fault Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
12. Alarm sounds and screen displays: **ACID TANK TOO LONG TO DRAIN** and printer prints: ALARM: HH:SS:MM ACID TANK TOO LONG TO DRAIN	1. Press **ACK** touch pad to acknowledge alarm. 2. Transfer valve closed – call STERIS.* 3. Floor drain obstructed – flush out line. 4. Press **RESUME CYCLE** touch pad to resume cycle operation. 5. If condition reoccurs, call STERIS.*
13. Alarm sounds and screen displays: **ACID TANK RTD FAILURE** and printer prints: ALARM: HH:SS:MM ACID TANK RTD FAILURE	**Faulty RTD sensor in detergent tank.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Faulty RTD sensor in detergent tank – clean as necessary. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. 4. If situation reoccurs, call STERIS.*
14. Alarm sounds and screen displays: **ACID TANK FAILED TO REACH TEMP** and printer prints: ALARM: HH:SS:MM ACID TANK FAILED TO REACH TEMP	1. Press **ACK** touch pad to acknowledge alarm. 2. Steam supply valve not fully open – open building and washer supply valves. 3. Temperature set too high – decrease programmed temperature set point. 4. Fill water temperature too low – increase temperature of building water supply. 5. Faulty RTD sensor in detergent tank – clean as necessary. 6. Press **RESUME CYCLE** touch pad to resume cycle operation. 7. If situation reoccurs, call STERIS.*
15. Alarm sounds and screen displays: **EMERGENCY STOP CABLE ACTIVATED** and printer prints: ALARM: HH:SS:MM EMERGENCY STOP CABLE ACTIVATED	**Safety cable pulled.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Open chamber door and remove obstruction from chamber. Press **RESUME CYCLE** touch pad to resume cycle operation or press **ABORT CYCLE** touch pad to abort cycle operation. 3. Safety cable too tight – call STERIS.* 4. Press **RESUME CYCLE** touch pad to resume cycle operation. 5. If situation reoccurs, call STERIS.*

** Service Charges may be incurred. Consult your warranty for details.*

Table 7-2. Fault Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
16. Alarm sounds and screen displays: **EMERGENCY STOP PRESSED** and printer prints: ALARM: HH:SS:MM EMERGENCY STOP PRESSED	**EMERGENCY STOP button pressed.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Pull out EMERGENCY STOP buttons on both control sides. 3. Press **RESUME CYCLE** touch pad to resume cycle operation or press **ABORT CYCLE** touch pad to abort cycle operation. 4. If situation reoccurs, call STERIS.*
17. Alarm sounds and screen displays: **COOLDOWN TANK TOO LONG TO FILL** and printer prints: ALARM: HH:SS:MM COOLDOWN TANK TOO LONG TO FILL	1. Press **ACK** touch pad to acknowledge alarm. 2. Self-cleaning screen clogged – remove debris from screen. 3. Pump suction strainer clogged – clean strainer. 4. Press **RESUME CYCLE** touch pad to resume cycle operation. 5. If situation reoccurs, call STERIS.*
18. Alarm sounds and screen displays: **COOLDOWN TANK TOO LONG TO COOL** and printer prints: ALARM: HH:SS:MM COOLDOWN TANK TOO LONG TO COOL	1. Press **ACK** touch pad to acknowledge alarm. 2. Cold water supply valve not fully open – open building and washer supply valves. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. 4. If situation reoccurs, call STERIS.*
19. Alarm sounds and screen displays: **COOLDOWN TANK TOO LONG TO DRAIN** and printer prints: ALARM: HH:SS:MM COLLDOWN TANK TOO LONG TO DRAIN	1. Press **ACK** touch pad to acknowledge alarm. 2. Drain valve not fully open – open valve. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. 4. If situation reoccurs, call STERIS.*

** Service Charges may be incurred. Consult your warranty for details.*

Table 7-2. Fault Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
20. Alarm sounds and screen displays: **COOLDOWN TANK FULL** and printer prints: ALARM: HH:SS:MM COLLDOWN TANK FULL	**Cooldown tank high water level malfunction** 1. Press **ACK** touch pad to acknowledge alarm. 2. Verify operation of float – clean as necessary. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. 4. If situation reoccurs, call STERIS.*
21. Alarm sounds and screen displays: **COOLDOWN TANK FLOAT FAILURE** and printer prints: ALARM: HH:SS:MM COOLDOWN TANK FLOAT FAILURE	1. Press **ACK** touch pad to acknowledge alarm. 2. Cooldown tank high or low water level malfunction – verify operation of float. Clean as necessary. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. 4. If situation reoccurs, call STERIS.*
22. Alarm sounds and screen displays: **COOLDOWN RTD DEFECTIVE** and printer prints: ALARM: HH:SS:MM COOLDOWN RTD DEFECTIVE	1. Press **ACK** touch pad to acknowledge alarm. 2. Cooldown tank RTD malfunction – clean RTD. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. 4. If situation reoccurs, call STERIS.*
23. Alarm sounds and screen displays: **pH TOO LOW** **CHECK INJ. SYSTEM** and printer prints: ALARM: HH:SS:MM pH TOO LOW CHECK INJ. SYSTEM	1. Press **ACK** touch pad to acknowledge alarm. 2. Acid neutralizer container empty – verify and replace container. 3. Wrong chemical used – verify and replace as necessary. 4. Self-cleaning screen clogged – clean strainer (if pH is done in sump). 5. Press **RESUME CYCLE** touch pad to resume cycle operation. 6. If situation reoccurs, call STERIS.*

** Service Charges may be incurred. Consult your warranty for details.*

Table 7-2. Fault Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
24. Alarm sounds and screen displays: **pH TOO HIGH** **CHECK INJ. SYSTEM** and printer prints: ALARM: HH:SS:MM pH TOO HIGH CHECK INJ. SYSTEM	1. Press **ACK** touch pad to acknowledge alarm. 2. Alkaline neutralizer container empty – verify and replace container. 3. Wrong chemical used – verify and replace as necessary. 4. Self-cleaning screen clogged – clean strainer (if pH is done in sump). 5. Press **RESUME CYCLE** touch pad to resume cycle operation. 6. If situation reoccurs, call STERIS.*
25. Alarm sounds and screen displays: **pH SIGNAL** **OPEN CIRCUIT** and printer prints: ALARM: HH:SS:MM pH SIGNAL OPEN CIRCUIT	1. Press **ACK** touch pad to acknowledge alarm. 2. Communication malfunction – call STERIS.* 3. Press **ABORT CYCLE** touch pad to abort cycle.
26. Alarm sounds and screen displays: **CONDUC. TOO LOW** **CHECK INJECT. SYSTEM** and printer prints: ALARM: HH:SS:MM CONC. TOO LOW CHECK INJ. SYSTEM	**Chemical container empty.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Verify and replace appropriate container. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. 4. If situation reoccurs, call STERIS.*
27. Alarm sounds and screen displays: **CARRIAGE SYSTEM FAILURE** and printer prints: ALARM: HH:SS:MM CARRIAGE SYSTEM FAILURE	1. Press **ACK** touch pad to acknowledge alarm. 2. Position switch failure, call STERIS.* 3. Press **ABORT CYCLE** touch pad to abort cycle.

** Service Charges may be incurred. Consult your warranty for details.*

Table 7-2. Fault Chart (Cont'd)

PROBLEM	POSSIBLE CAUSE AND CORRECTION
28. Alarm sounds and screen displays: **PLC CONTROLLER BATTERY LOW** and printer prints: ALARM: HH:SS:MM PLC CONTROLLER BATTERY LOW	1. PLC battery needs to be replaced – call STERIS.* 2. Press **ACK** touch pad to acknowledge alarm.
29. Alarm sounds and screen displays: **UNKNOWN FAILURE DETECTED** and printer prints: ALARM: HH:SS:MM UNKNOWN FAILURE DETECTED	1. A communication fault has occurred in the control – call STERIS.* 2. Press **ACK** touch pad to acknowledge alarm.
30. Alarm sounds and screen display shows: **WASHER LOCKED** and printer prints: HH:SS:MM WASHER LOCKED	LOCK/UNLOCK/INIT key switch is in **LOCK** position. 1. Turn key selector to **INIT** and then return selector to **UNLOCK** position. 2. Press **ACK** touch pad to acknowledge alarm.

** Service Charges may be incurred. Consult your warranty for details.*

REPLACEMENT PARTS AND PRODUCTS

8

IMPORTANT: *A listing of the Safety Precautions to be observed when operating this Cage and Bottle Washer can be found in SECTION 1. Do not operate equipment until you have become familiar with this information.*

The parts listed in this section are those that would be necessary to do minor maintenance on this washer.

When ordering replacement parts or cleaning products, please include part numbers and the descriptions as listed in **Table 8-1**. To hasten service to you, include on your order the serial, equipment and model numbers of your washer.

Table 8-1. Replacement Parts

DESCRIPTION	PART NUMBER	QTY
Common Parts:		
O-RING, Self-Cleaning Screen	P117905-503	3
FUSE 5A, 250V	P117901-328	1
FUSE 0.5A, 250V	P117940-574	1
FUSE 3A, 250V	P117909-744	1
FUSE 8A, 250V	P117909-473	1
FUSE 30A, 600V	P117033-732	3
RELAY, RT424615	P117914-766	1
SWITCH, Water Level, Madison M5010	P117903-117	1
SWITCH, Water Level, Madison M5002-6032	P1170109-220	1
RTD, 223-11341-01	P117914-352	1
RELAY, Solid State	P117902-412	5
TUBING, Marprene, for Chemical Pump	P117950-583	2
LUBRICANT, Silicone	P117950-599	1
KIT, Repair, 302-280 for Water Valve 1" brass, 117903-825/8210G4	P117950-212	1
COIL, 23881232, for Water Valve 1" brass, 117903-825/903-823	P117955-189	1

Table 8-1. Replacement Parts (Cont'd)

DESCRIPTION	PART NUMBER	QTY
208 Volts:		
OVERLOAD, 3RU1126-4CBO	P117912-553	1
480 Volts:		
FUSE 4A, 600V	P117912-553	2
OVERLOAD, 3RU1126-1JBO	P117911-133	1
Steam Heated:		
KIT, Repair, 312-702 for Steam Valve 3/4", Brass	P117951-286	1
COIL, 23821232 for Steam Valve 3/4", Brass 117-956-361/8220G23	P117955-189	1
STEAM TRAP, 3/4", TD52	P117950-360	1
Heat Exchanger:		
KIT, Repair, 304-392 for Steam Valve 1", Brass 117950-999/822025	P117951-000	1
COIL, 23881232 for Water Valve 1", Brass 117956-360/903-823	P117955-189	1
STEAM TRAP, 3/4", TD52	P117950-360	1
Drain Discharge Cool Down:		
KIT, Repair, 302-280 for Water valve 1", Brass 117903-825/8210G4	P117950-212 or P764315-482	1
COIL, 23881232 for Water Valve 1", 117903-825/903-823	P117955-189	1
Exhaust Fan		
GASKET, Removal Fan	P117903-068	1
EXHAUST FAN ASSEMBLY	P117908-363	1

Table 8-1. Replacement Parts (Cont'd)

DESCRIPTION	PART NUMBER	QTY
With Condenser:		
Kit, Repair 302-273 for Water Valve 1/2" Brass 117956-359/SC8210G2	P117950-174	1
COIL, 23821232 for Water Valve 1", Brass, 117956-359/SC8210G2	P117955-186	1
Vertical Rise Doors:		
GASKET, Door, Bottom	P117941-805	1
GASKET, Door, Top	P117941-810	1
SWITCH, Door, 3SE2120-1E	P117915-116	1
pH Neutralization and Detergent Monitoring System:		
pH Probe	P117909-559	1

MAINTENANCE MANUAL

Maintenance Instructions
Basil® 4700 Cage and Rack Washer

(2008/10/15) **P764333-098**

A WORD FROM STERIS CORPORATION

This manual contains important information on the proper use and routine maintenance of the Basil® 4700 Cage and Rack Washer. **All personnel involved in the use and maintenance of this equipment must carefully review and comply with the Safety Precautions and instructions contained in this manual.** These instructions are important to protect the health and safety of personnel operating this washer and should be retained in a conveniently accessible area for quick reference. This equipment is specifically designed only for the uses outlined in this manual.

Complete instructions for uncrating and connecting utilities, as well as equipment drawings, have been provided. If they are missing, contact STERIS for replacement copies, providing the serial and model numbers of the washer.

STERIS provides a line of accessories for use with this washer. A STERIS representative will gladly review these with you.

ADVISORY

IMPORTANT: *A listing of the Safety Precautions to be observed when operating and servicing this washer can be found in SECTION 1 of this manual. Do not operate or give service to the equipment until you have become familiar with this information.*

Any alteration of this equipment not authorized or performed by STERIS will void the warranty. Alteration of equipment which could adversely affect its operation and efficacy may violate national, state and local regulations and could jeopardize your insurance coverage.

The protection provided by the equipment may be impaired if the equipment is used in a manner not specified by STERIS.

To help ensure operators are adequately trained in the safe use of the equipment, STERIS recommends:

- all personnel who operate or maintain the equipment are trained in its operation and in its safe use;

- personnel working with toxic chemicals and vapors (if applicable) have comprehensive instructions in the washer disinfector process, relevant health hazards and methods to detect the escape of toxic materials;

- there is regular training of all personnel concerned with the operation and maintenance of the equipment; attendance records are maintained; and that evidence of understanding is demonstrated;

- current Material Safety Data sheets (MSDS) should be available to all users in the department. For current MSDS sheets, contact STERIS.

INDICATIONS FOR USE

The **Basil 4700 Cage and Rack Washer** is a heavy duty, large capacity hydrospray washer specifically designed for thorough, efficient cleaning of cages, racks, debris pans and miscellaneous items used in the care of laboratory animals.

The **Basil 4700 Cage and Rack Washer** is intended only to process goods as outlined in operator manual. If there is any doubt about a specific material or product, contact product manufacturer for recommended washing technique.

SERVICE INFORMATION

A thorough preventive maintenance program is essential to help ensure safe and proper equipment operation. This manual contains maintenance schedules and procedures which should be followed for satisfactory equipment performance.

Customers are encouraged to contact STERIS concerning our comprehensive annual maintenance agreements. Under the terms of these agreements, preventive maintenance, adjustments and replacement of worn parts are performed on a scheduled basis to help ensure equipment performance at peak capability and to help avoid untimely and costly interruptions. STERIS maintains a global staff of well-equipped, qualified service technicians to provide this service, as well as expert repair services. Please contact STERIS for details.

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CERTIFICATION

This **Basil 4700 Cage and Rack Washer** compiles with the following standards:

- **Underwriters Laboratories, Inc. (UL)**
  UL 61010-1, Second Edition.
- **Canadian Standards Association (CSA)**
  CAN/CSA-C22.2 No. 61010-1, Second Edition.

Manufacturer:
Corporation STERIS
Canada
Quebec, Qc, CANADA

ISO 13485
ISO 9001
Certified
Facility

The base language of this document is ENGLISH. Any translations must be made from the base language document.

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Section 1: Safety Precautions

The following *Safety Precautions* **must** be observed when operating or servicing the **Basil® 4700 Cage and Rack Washer.** WARNING indicates the potential for personal injury and CAUTION indicates the potential for damage to equipment. For emphasis, certain *Safety Precautions* are repeated throughout the manual. **It is important to review ALL *Safety Precautions* before operating or servicing the washer.**

Strictly following these *Safety Precautions* enhances your ability to safely and effectively utilize the unit and helps the customer avoid improper maintenance methods which may damage the unit or render it unsafe. It is important to understand that these *Safety Precautions* are not exhaustive; Customers are encouraged to develop their own safety policies and procedures to enhance and compliment these *Safety Precautions*.

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:

Always wear appropriate Personal Protective equipment (PPE) when cleaning or removing debris from bottom of wash chamber and over suction plate.

Only STERIS or STERIS-trained service personnel should make repairs and adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel or installation of unauthorized parts could cause personal injury, invalidate warranty or result in costly damage. Contact STERIS regarding service options.

Regularly scheduled preventive maintenance in addition to faithful performance of minor maintenance described in this manual, is required for safe and reliable operation of this equipment. Contact STERIS to schedule preventive maintenance.

To open doors from inside wash chamber, pull EMERGENCY STOP cables. Washer operation will automatically stop. Then, push firmly on door panel using shoulder and upper arm, applying upper body force.

When checking rotation of drive motor, use extreme caution. If rotation is incorrect, carriage will run directly into the door header.

WARNING – PERSONAL INJURY HAZARD:

Never perform cleaning of wash chamber until full cycle has been completed. If cycle has not been completed, contaminated debris or water may remain in the bottom of the wash chamber.

Keep fingers away from door hinges to prevent pinching.

WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD:

Always set building electrical-supply disconnect switch and console master power switch to OFF before performing any preventive maintenance functions within compartments. Electrical shock can cause serious injury.

Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

Fasteners and star washers are used to ensure protective bonding continuity. Always reinstall any star washer which may have been removed during installation or servicing.

WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD:

Detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin or attempt to swallow. Read and follow the precautions and instructions on the detergent label and in the Material Safety Data Sheet (MSDS) prior to handling the detergent, refilling the detergent container or servicing the detergent injection pump. Wear appropriate Personal Protective Equipment (PPE) whenever handling the detergent or servicing the detergent injection pump and lines.

Wear appropriate Personal Protective Equipment (PPE) including gloves and eye protection when using a descaling product. Avoid contact with eyes or skin. If chemical product was swallowed or in contact with eyes or skin, read and follow precautions and instructions on detergent label and in Material Safety Data Sheet (MSDS) and seek medical attention immediately.

Wear appropriate Personal Protective Equipment (PPE) when removing clamps and replacing squeeze tubes. If chemical contacts skin or eyes, immediately flush with running water for at least 10 minutes. If contact was with eyes, seek medical attention.

WARNING – BURN HAZARD:

Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.

Pipes may be extremely hot.

WARNING – SLIPPING HAZARD:

To prevent slips, keep floor dry. Promptly cleanup any spills or drippage. If spills or drippage are detergents or other chemicals, follow Safety Precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

CAUTION – POSSIBLE EQUIPMENT DAMAGE:

Always use a silicone lubricant to lubricate squeeze tubes. Petroleum-based lubricants, such as Vaseline®[1] or grease, will cause squeeze tubes to melt.

Use nonabrasive cleaners when cleaning unit. Follow directions on containers and rub in a back-and-forth motion (in same direction as surface grain). Abrasive cleaners will damage stainless steel. Cleaners rubbed in a circular motion or applied with a wire brush or steel wool on door and chamber assemblies can be harmful to stainless steel. Do not use these cleaners on painted surfaces.

Ensure a cooling fan is attached to rear motor shaft. Check that the fan blades are positioned to send airflow to motor. Motor will overheat without a cooling fan

Carefully tighten setscrew. Metal setscrew can easily strip plastic threads in roller block assembly.

[1] *Vaseline is a trademark of Chesebrough Pond's Incorporated.*

Tables 1-1 and 1-2 define certain symbols which may be on your **Basil 4700 Cage and Bottle Washer** components:

Table 1-1. Definition of Symbols on Unit

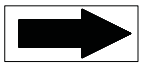
Symbol	Definition
	Protective Earth (Ground).
	Fuse Identification.
	Pump Rotation.
	Attention, Consult Manual for Further Instructions.
	Warning! Risk of Electrical Shock.

Table 1-2. Definition of Symbols on Nameplate

Symbol	Definition
MODEL	Model Number of Unit.
S/N	Serial Number of Unit.
V_~	Volt, Number of Phase (3 or 1), Alternate Current.
WIRE	Number of Wires in the Electrical Cable (Ground Not Included).
YEAR	Year of Manufacture of Unit.
k	Kilovolt.
A	Amperage Rating of Unit.
Hz	Hertz – Frequency of Unit.

Section 2: Service Mode Procedures

IMPORTANT: *A listing of the Safety Precautions to be observed when operating and servicing this Cage and Rack Washer can be found in SECTION 1 of this manual. Do not operate or service the equipment until you have become familiar with this information.*

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: Only STERIS or STERIS-trained service technicians should make repairs and adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel or installation of unauthorized parts could cause personal injury, invalidate warranty or result in costly damage. Contact STERIS regarding service options.

IMPORTANT: *Before entering Service mode, always write down current cycle parameters. If printer is present, always obtain a printout of current cycle parameters.*

2.1 HOW TO ENTER SERVICE MODE

Service mode allows service technician to set general operating parameters and to verify control inputs/outputs for **Basil® 4700 Cage and Rack Washer** proper operation.

1. Press **OPTIONS** touch pad on mode selection screen.
2. Press **SERVICE** touch pad on Options screen. A numeric keyboard appears.
3. On numeric keyboard screen, enter predefined **PASSWORD** using available touch pads.

   NOTE: Predefined password is composed of last four digits of washer serial number, inverted by pairs. For example, if last four digits are 1234, service access code is 3412.
4. Press **ENTER** on numeric keyboard. Display shows Service Mode screen.

   NOTE: If password entered is wrong or supervisor user is selected, display shows: ***Username or Password is Not Recognized Please Try Again****.*

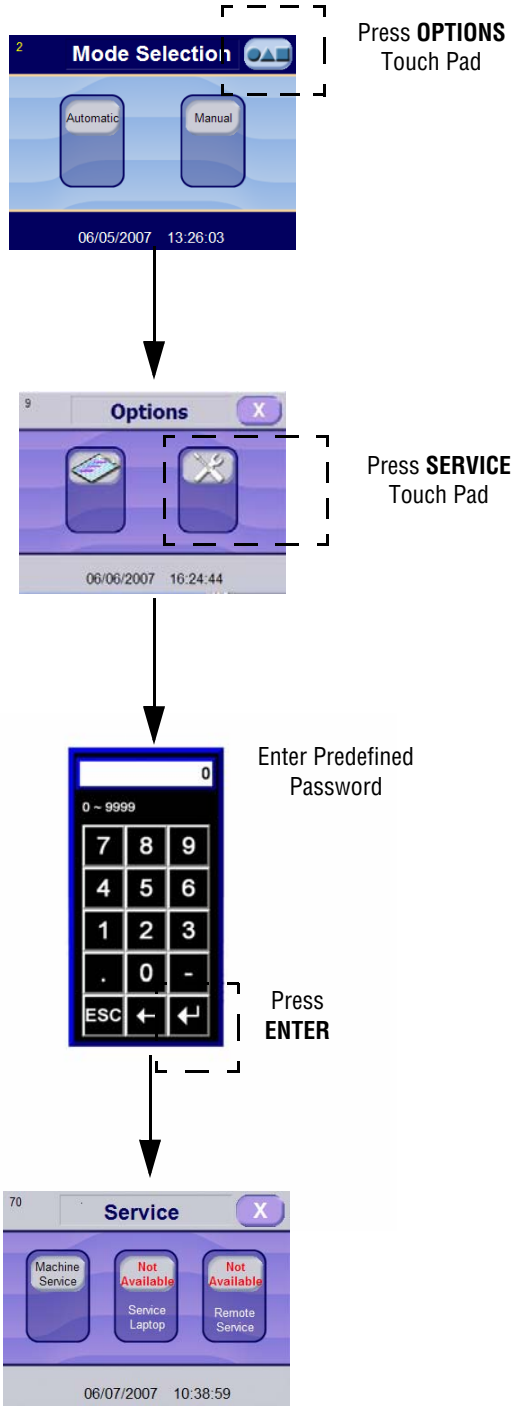


Figure 2-1. Enter Service Mode

2.2 HOW TO CONFIGURE WASHER

1. Enter Service Mode as described in *SECTION 2.1, HOW TO ENTER SERVICE MODE*.
2. In Service Mode screen, press **MACHINE SERVICE** touch pad.
3. In Machine Service screen, press **MACHINE SETUP** touch pad.

   See **Table 2-1**, *Hardware Configuration*, and **Table 2-2,** *System Options*, for additional information on selections available and default configurations.

   IMPORTANT: *Ensure all modifications are properly completed before operating washer.*

Table 2 - 1: Hardware Configuration

Parameter	Description
Serial Number	Unit Serial Number
Door Interlocks	ON prevents doors from opening at the same time to avoid cross contamination OFF allows doors to open at the same time
Detergent Conductivity Option	Enables or Disables Conductivity Detergent Injection Option (if present)
Alkaline Tank	Enables Alkaline Tank (if present)
Drain Cooldown	Enables or Disables Drain Cooldown Option (if present)
Filling Heat Exchanger	Enables or Disables Heat Exchanger Option (if present)
pH Neutralization	To select type of neutralization: - None: no neutralization - Time Based: Time based injection is performed before draining water - pH meter: A pH meter is used to inject proper amount of neutralizer before draining
Cooldown Tank	Enables Cooldown Tank (if present)
Non-Recirculated Final Rinse	Enables or disables Non-Recirculated Final Rinse System (if present)
Bottle Wash	Enables Feeder Bottle Washing System (if present)
Fully Drainable Sump	Enables Fully Drainable Sump function (if present)
Rack Flush	Enables or disables Rack Flush System

Table 2 - 1: Hardware Configuration (Cont'd)

Parameter	Description
Central Header	Enables Central Header (if present)
Acid Option	None Without Acid Tank With Acid Tank

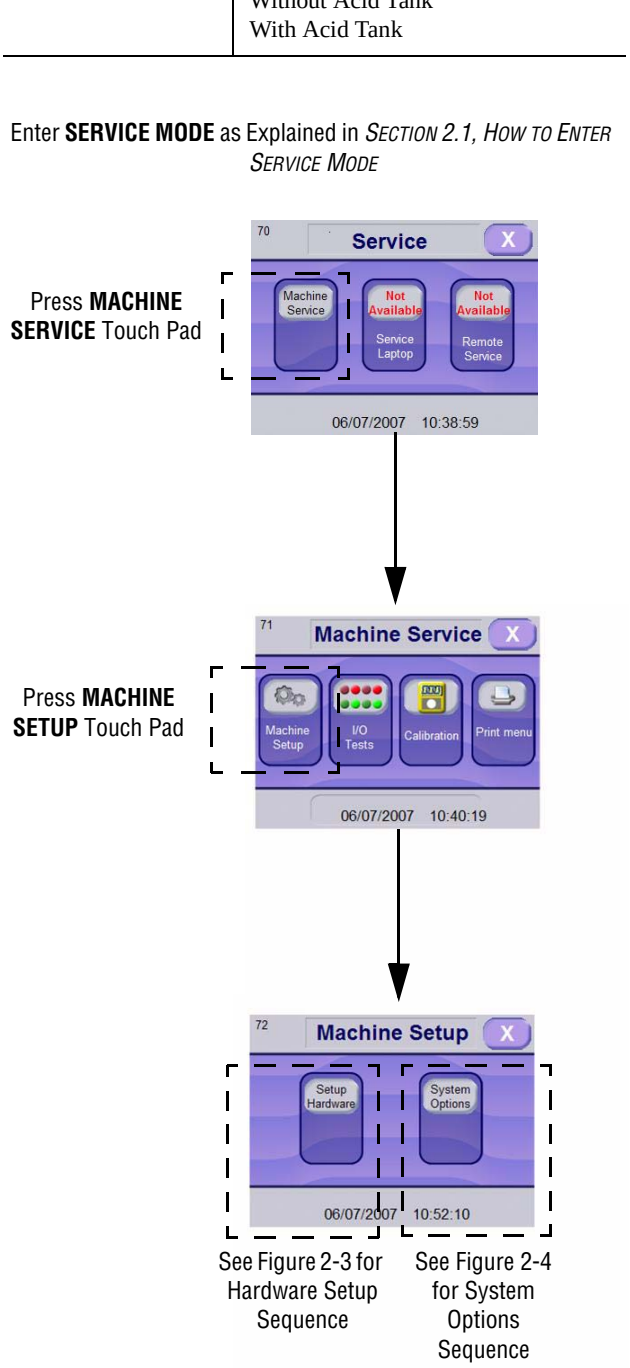


Figure 2-2. Washer Configuration

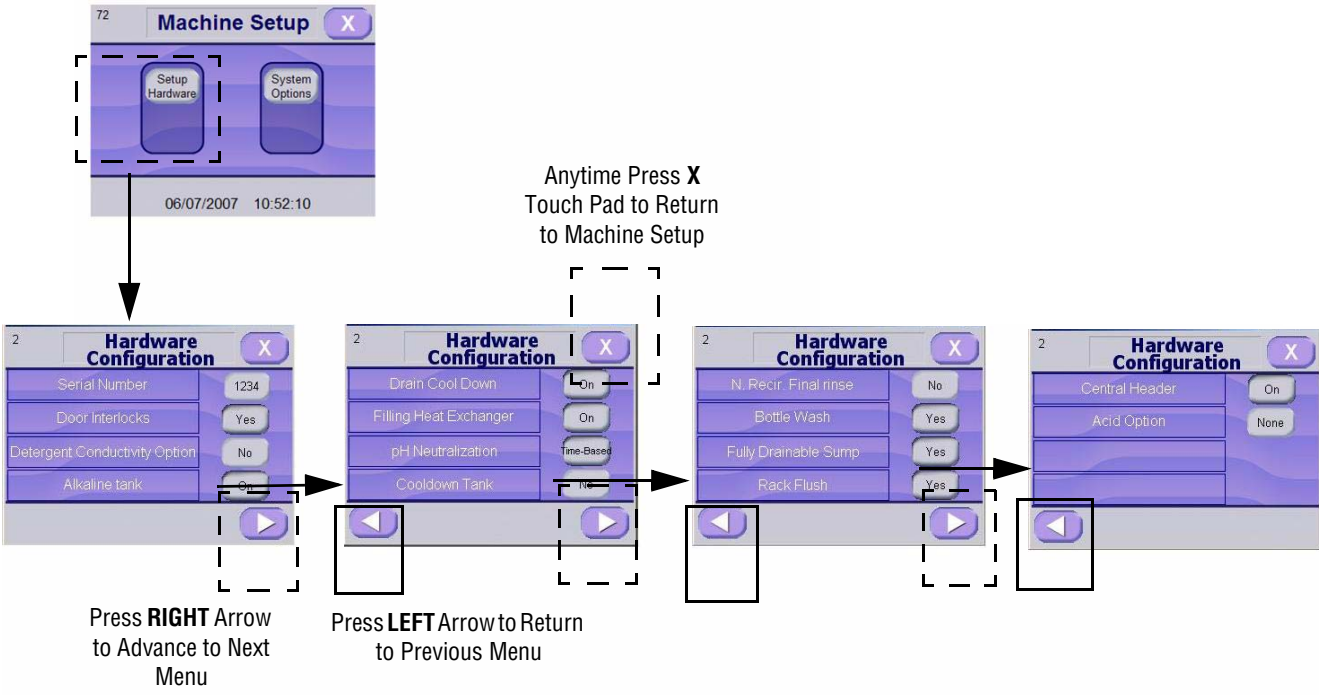


Figure 2-3. Hardware Configuration

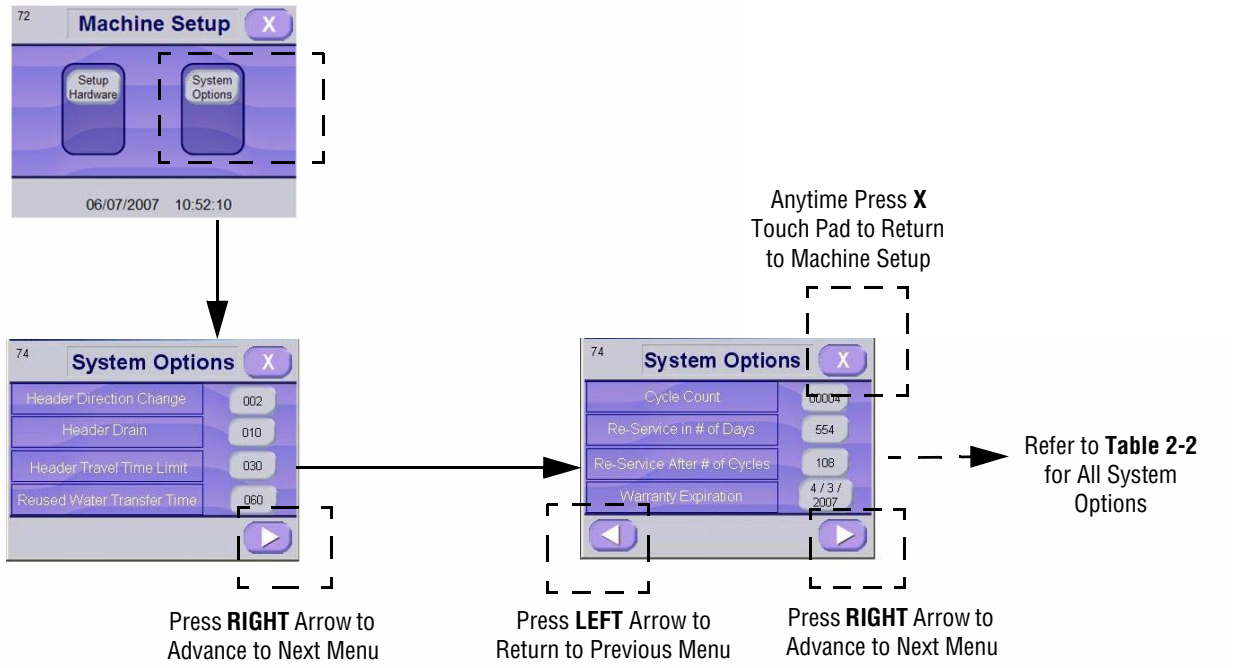


Figure 2-4. System Options

Table 2 - 2: System Options

Description	Default	Range	Units	Description
Number of chemical pumps	Without pH neutralizer: 2 With pH neutralizer: 3	 2 2-3	 pumps pumps	Alkaline and acid detergent are always present, third pump is acid neutralizer.
Cycle Count	00000001	[00000000 - 99999999]	N/A	—
Reservice in XXXX Cycles	9999	[0001 - 9999]	N/A	Number of cycles before next maintenance warning.
Warranty Expiration	YY/MM/DD		N/A	This date is used to give warnings before warranty ends.
Sump Filling Alarm	300	[60 - 6000]	Sec.	Maximum time to fill sump with water.
Sump Draining Alarm	60	[01 - 6000]	Sec.	Maximum time to drain sump water.
Sump Heating Alarm	600	[60 - 3000]	Sec.	Maximum time to heat sump water.
Cycle Complete Notification	60	[01:00 -6000]	Sec.	Maximum time buzzer is activated for the end of cycle notification.
Detergent Monitoring Time	180	[00:01 -6000]	Sec.	Maximum time allowed to reach conductivity setpoint before an alarm.
pH Neutralization Limits	Low = 06 Hi = 09	[01 - 14] [06 - 09]	pH	Maximum/minimum limits for pH neutralization.
pH Neutralization Mix Time	45	[1 -99]	Sec.	Time pH must be within range before draining.
Alkaline Neutralizer Inject = XX Wait = XX	Inject = 05 Wait = 45	[02 - 99] [30 - 99]	Sec.	When injecting neutralizer, pump is pulsed ON and OFF. Inject time is the time pump is ON. Wait time is the time pump is OFF.
Acid Neutralizer Inject = XX Wait = XX	Inject = 10 Wait = 45	[02 - 99] [30 - 99]	Sec.	
ph Neutralization Number of Tries	09	[03 - 15]	N/A	Maximum number of injections allowed before giving an alarm.
High pH Containment Injecting Time	02	[01 - 98]	Sec.	Shorter injection time used when neutralizing treatment without detergent or after pH overshoot.
Low pH Containment Injecting Time	06	[01 - 98]	Sec.	

2.3 HOW TO PERFORM TESTS

See **Table 2- 2** for an overview of options available through Test menu.

2.3.1 How to Test (Energize and De-Energize) Outputs

1. Enter Service Mode as explained in *SECTION 2.1, HOW TO ENTER SERVICE MODE*.
2. Press **MACHINE SERVICE** touch pad. Screen advances to Machine Service screen.
3. In Machine Service screen press **I/O TESTS** touch-pad. Screen advances to I/O Group screen.
4. Press **RIGHT** arrow to advance screen to desired I/O screen menu.

   Some outputs are interlocked with other outputs or inputs, i.e. they cannot be activated before a certain condition has been met:

   - When traveler reaches a position sensor, traveler movement is stopped (start position sensor is not considered if traveler is going in the opposite direction).
   - If door interlock option is present, a door can be locked only if it is closed.
   - To activate wash chamber circulation pump, washer door(s) must be closed.
   - To activate alkaline or acid tank dump, washer door(s) must be closed.
   - To activate non-recirculated final rinse, washer door(s) must be closed.
   - To activate sump filling sequence, washer door(s) must be closed.
   - To activate rack flush system, washer door(s) must be closed.
   - To activate alkaline pump, washer door(s) must be closed and acid pump must be off.
   - To activate acid pump, washer door(s) must be closed and alkaline pump must be off.
   - To activate alkaline neutral pump, washer door(s) must be closed and acid neutralizer pump must be off.
   - To activate acid neutralizer pump, washer door(s) must be closed and alkaline neutralizer pump must be off.
5. In I/O Test screen, press **INPUTS & OUTPUTS** touch pad. Use **RIGHT** arrow to advance screen until desired I/O group.
6. To energize output, press desired touch pad. Selected touch pad darkens.
7. Press touch pad again to de-energize output.
8. Input state can be visualized on left side of screen. Red circle on left side of screen indicates corresponding condition is true.

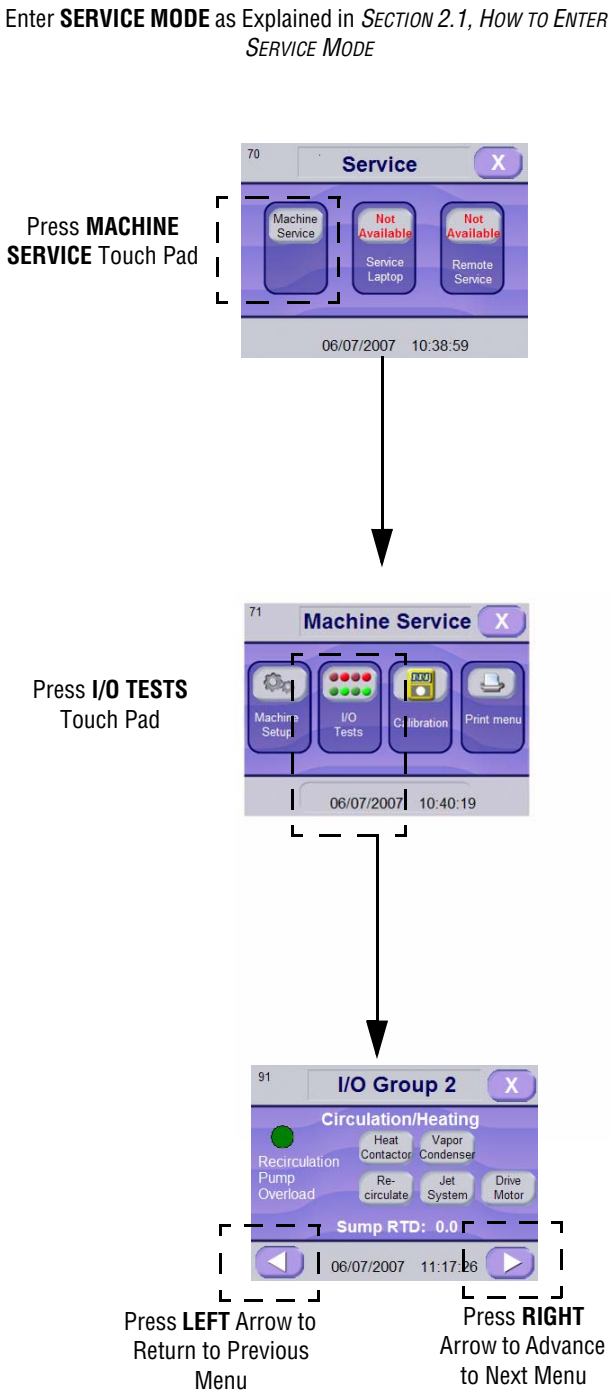


Figure 2-5. Performing Tests

2.3.2 How to Test Printer

See **Table 2-1**, *Hardware Configuration* and **Table 2-2**, *System Options*, for additional information on options available through Test menu.

IMPORTANT: *Printer must be enabled in Supervisor mode before performing the following test (see SECTION 2.6, ENABLE/DISABLE PRINTER).*

1. Enter Service mode as explained in *SECTION 2.1, HOW TO ENTER SERVICE MODE*.
2. In Service Mode screen, press **I/O TESTS** touch pad.
3. In I/O Test screen, press **PRINTER** touch pad.
4. Select and press any touch pad. Characters are sent to printer. Verify generated printout.

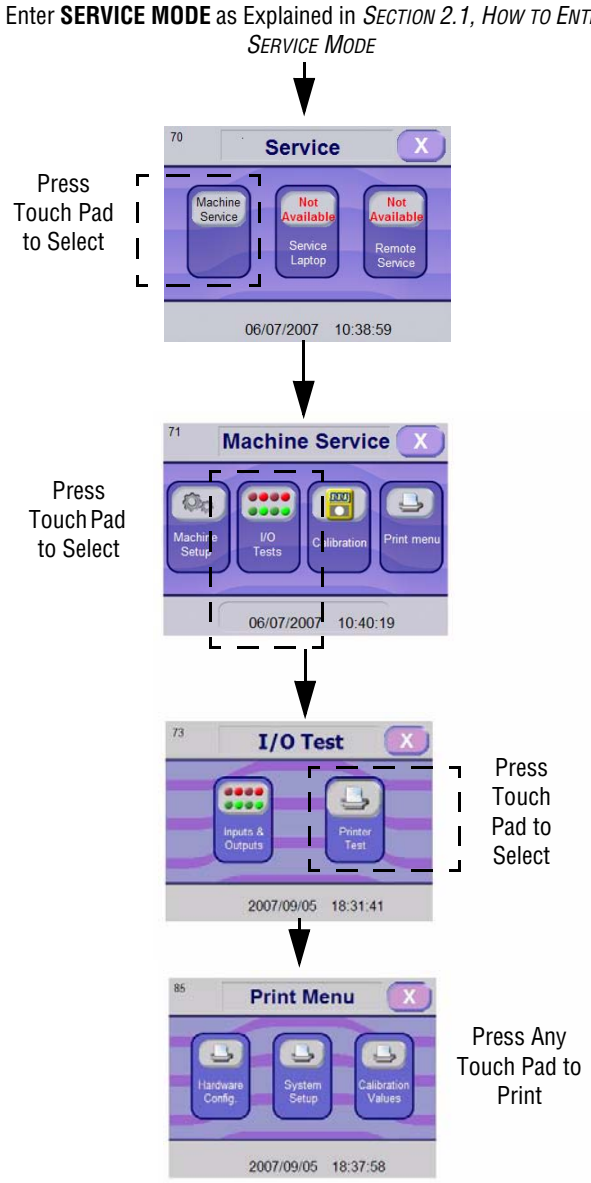


Figure 2-6. Testing Printer

2.4 CALIBRATION

1. Enter Service Mode as explained in *SECTION 2.1, HOW TO ENTER SERVICE MODE*
2. Press **MACHINE SERVICE** touch pad. Screen advances to Machine Service screen.
3. Press **CALIBRATION** touch pad.
4. In Calibration screen, press **MANUAL CALIBRATION** touch pad; then, follow calibration procedure instructions appearing on screen. It is possible to calibrate pH sensor and conductivity sensor.

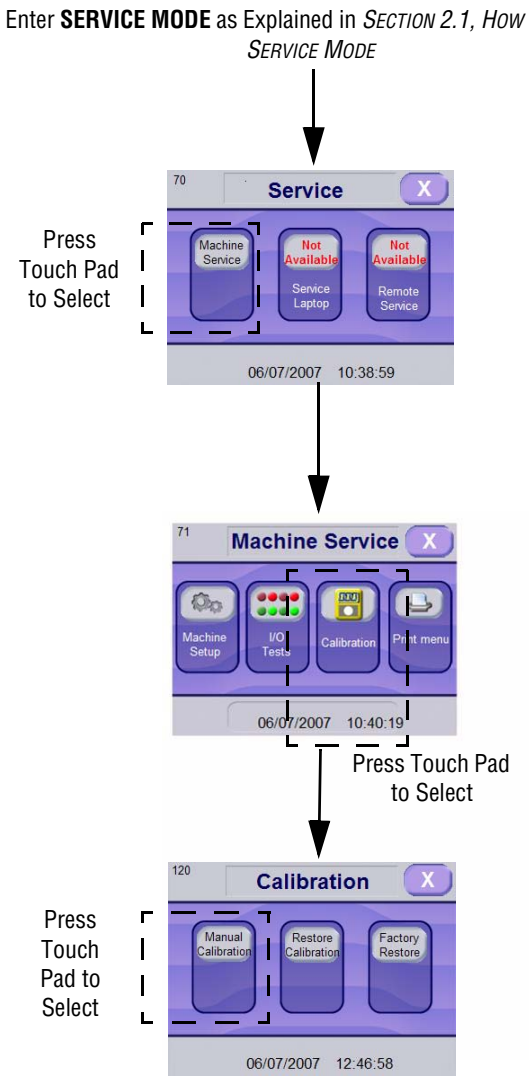


Figure 2-7. Calibration

- **How to Restore Calibration Values**

  Restore Calibration touch pad allows entering calibration values saved after previous calibration.

  Factory Restore touch pad restores factory's default calibration.

2.5 THORNTON CONTROLLER

⚠ CAUTION – POSSIBLE EQUIPMENT DAMAGE: Always read solution labels for handling instructions.

2.5.1 Conductivity Sensor (Channel A)

- Material Required:

  5000µS/cm buffer solution (P117906-175);

  150ml Beaker;

  Digital thermometer

  Distilled Water.

  NOTE: Write down batch number and expiration date for buffer solution. Never use an expired solution.

2.5.2 Edit Calibration Constants for Conductivity Sensor (Channel A)

1. Find calibration values on cable label sensor. Write down values.

   Cell M: _____
   Temp M: _____

2. Press **MENU** button; press arrow **UP** until display shows:

   Edit Sensor Calibration

3. Press **OK/RESET** button, display shows:

   A Cell M = XXXXXX_

4. Use arrows to enter **Cell M** sensor value, display shows:

   A Cell M = YYYYYY_

5. Use arrows to select Cell; then, press arrows **UP** or **DOWN**. Display shows:

   A Temp M = XXXXXX_

6. Use arrows to enter **Temp M** sensor value, display shows:

   A Temp M = ZZZZZZ_

7. Press **OK/RESET**, display shows:

   Save Changes Yes.

8. Press **OK/RESET** to confirm values.

2.5.3 Conductivity Sensor Calibration (Channel A)

NOTE: Ensure no water remains in sump before starting this procedure.

1. Pour 50mL of 5000µS buffer solution in a 150mL beaker.

   NOTE: Buffer solution cannot be re-used. Do not return solution to container.

2. Carefully take sensor out from sampling port located above recirculation pump piping.

3. Spray sensor tip with distilled water to rinse. Do not rub or hit sensor bubble.

   NOTE: Glass bubble at sensor's tip is very fragile, never hit or rub. Never leave sensor in open air for too long, always immerse in a liquid so bubble does not dry.

4. Dab sensor tip with a soft lint-free cloth to remove excess of water.

5. Dip sensor into buffer solution.

6. Press **CALIBRATE** button, display shows:

   Calibrate Sensor

7. Press **OK/RESET** button, display shows:

   Cal sensor Ch A

8. Press **OK/RESET** button to select A sensor, display shows:

   Cal Ch A|1 : Res

9. Press arrow **UP** until display shows:

   Cal Ch A|1 : Con

10. Press **OK/RESET** touch pad, display shows:

    A Con = 100.00µ

11. Press arrows to enter 5000.0µ, display shows:

    A Con = 5000.00µ

12. Press **OK/RESET** button, display shows:

    A= X.XXXX OK?

    NOTE: X.XXXX corresponds to value detected by sensor.

13. Wait for value stabilization; then, press **OK/RESET** to accept value. Display shows:

    Done, press OK?

14. Press **OK/RESET** button. Display shows:

    Do point #2? No

15. Press **OK/RESET** button again. Display shows:

    Save Changes Yes

16. Press **OK/RESET** button again to end sensor calibration.

17. Rinse sensor with distilled water. Dab with a clean lint-free cloth and re-install into sampling port.

2.5.4 pH Sensor (Channel B) (If Option is Present)

- Material Required:

  pH-4 buffer solution (P117903-080)

  pH-10 buffer solution (P117908-381);

  Three 150mL Beakers;

  Digital thermometer with thermocouple;

  NaHCO3 (sodium bicarbonate)

  IMPORTANT: *Always refer to product label for handling procedures.*

  NOTE: Write down batch number and expiration date for buffer solution. Never use an expired solution.

2.5.5 Edit Calibration Constants for pH Sensor

1. Find calibration values on cable label sensor. Write down values.

   Cell A: _____

   Cell M: _____

   Temp M: _____

2. Press **MENU** button. Use arrow **UP** until **EDIT SENSOR CALIBRATION** menu appears.
3. Press **OK/RESET** button, display shows:

   A Cell M = XXXXXX_
4. Use arrow **UP** to select **channel B**, display shows:

   B Cell M = XXXXXX_
5. Use arrows to enter **Cell M** sensor value. Display shows:

   B Cell M = YYYYYY_
6. Use **RIGHT** or **LEFT** arrows to select **M**; then, press **UP** or **DOWN** arrows. Display shows:

   B Cell A = XXXXXX_
7. Use arrows to enter **Cell A** sensor value, display shows:

   B Cell A = WWWWWW_
8. Use arrows to select **A**; then, press **UP** or **DOWN** arrows. Display shows:

   B Cell M = YYYYYY_
9. Use arrows to select **Cell**; then, press **UP** or **DOWN** arrows. Display shows:

   B Temp M = XXXXXX_
10. Use arrows to enter **Temp M** sensor value. Display shows:

    B Temp M = ZZZZZZ_
11. Press **OK/RESET** button, display shows:

    Save Changes Yes
12. Press **OK/RESET** button to confirm changes.

2.5.6 Temperature Calibration

NOTE: For ph sensor, take note of the following:

1 ph sensor is located in sampling port above pressure pump piping; if Cooldown tank option is present, sampling port is in Cooldown tank side piping.

2 Drain Cooldown tank before starting this procedure, refer to SECTION 4.8.6, DRAINING COOLDOWN TANK, in Operator Manual (P920509-645) for detailed procedure.

1. Carefully take sensor out from sampling port .
2. Spray sensor tip with distilled water to rinse. Do not rub or hit sensor bubble.

   NOTE: Glass bubble at sensor's tip is very fragile, never hit or rub. Never leave sensor in open air for too long, always immerse in a liquid so bubble does not dry.
3. Dab sensor tip with a soft lint-free cloth to remove excess of water.
4. Dip pH sensor and digital thermometer thermocouple in pH-4 buffer solution; wait for reading to stabilize.
5. On Thornton controller, press **CALIBRATE** button. Use **UP** arrow to select **Calibrate Sensor**, then, press **OK/NEXT**. Display shows:

   Cal Sensor Ch A
6. Use UP arrow to select **channel B**, display shows:

   Cal Sensor Ch B
7. Press **OK/RESET** button, display shows:

   Cal Ch B #1 : Res
8. Use **UP** arrow to select °C, display shows:

   Cal Ch B #1 : °C
9. Press **OK/RESET** button, display shows:

   B °C = 25.000_
10. Use arrows to enter value indicated in digital thermometer. Display shows:

    B °C = XX.XXX_

    NOTE: XXX.XXX corresponds to value indicated in digital thermometer.
11. Press **OK/RESET** button, display shows:

    B= YYYYY°C OK?

NOTE: YYYYY corresponds to value read by ph sensor (this value can be different from the one in digital thermometer).

12. Press **OK/RESET** button, display shows:

Done, press OK?

13. Press **OK/RESET** button, display shows:

Do point #2? No

14. Press **OK/RESET** button, display shows:

Save Changes Yes

15. Press **OK/RESET** button to end temperature calibration.
16. Use **UP** arrow until display shows:

B*.pH *.**°C**

*NOTE: *.** corresponds to values read by ph sensor.*

17. Control should display the same as the value indicated by digital thermometer **(+/- 0.5°C)**.

2.5.7 pH Sensor Calibration (Point #1)

NOTE: Write down batch number and expiration date for buffer solution. Never use an expired solution.

1. Transfer approx. 80 ml of pH-4 buffer solution in a beaker and label.
2. Transfer approx. 80 ml of pH-10 buffer solution in another beaker and label.
3. Fill the third beaker with tap water.
4. Remove cap from ph sensor and dip sensor into beaker filled with tap water to rinse.

NOTE: Glass bubble at sensor's tip is very fragile, never hit or rub. Never leave sensor in open air for too long, always immerse in a liquid so bubble does not dry.

5. Dab sensor tip with a soft lint-free cloth to remove excess of water.

***IMPORTANT:** Do not discard solution contained in cap; sensor must soak in this solution during calibration.*

6. On Thornton controller, press **CALIBRATE** button. Use **UP** arrows to select **CALIBRATE SENSOR**; then, press **OK/NEXT** button. Display shows:

Cal Sensor Ch A

7. Use **UP** arrow to select channel **B.** Display shows:

Cal Sensor Ch B

8. Press **OK/RESET** button, display shows:

Cal Ch b #1 : Res

9. Use **UP** arrow to select pH, display shows:

Cal Ch B #1 : pH

10. Press **OK/RESET** button, display shows:

B pH = 7.0000_

11. Dip pH sensor in pH-4 buffer solution.
12. Use arrows to enter value indicated on buffer solution of 4-pH (4.000_). Display shows:

B pH =4.0000_

13. Press **OK/RESET** button, display shows:

B= *.*pH OK?**

*NOTE: *.*** corresponds to value read by sensor. This value can be different from value read in buffer solution*

14. Allow time for value to stabilize; then, press **OK/RESET** button. Display shows:

Done, press OK

2.5.8 pH Sensor Calibration (Point #2)

NOTE: Write down batch number and expiration date for buffer solution. Never use an expired solution.

1. Remove sensor from pH-4 buffer solution and rinse well.
2. Spray sensor tip with distilled water to rinse. Do not rub or hit sensor bubble.

NOTE: Glass bubble at sensor's tip is very fragile, never hit or rub. Never leave sensor in open air for too long, always immerse in a liquid so bubble does not dry.

3. Dab sensor tip with a soft lint-free cloth to remove excess of water.
4. Dip sensor in pH-10 buffer solution.
5. In Thornton controller press **OK/RESET** button, display shows:

Do point#2? No.

6. Use **UP** arrow to select **YES**, then, press **OK/NEXT** button, display shows:

B pH = 7.0000

7. Use arrows to enter value indicated on buffer solution (10.000_) display shows:

B pH = 10.000

8. Press **OK/RESET** button, display shows:

   B = *.*pH OK?**

   *NOTE: *.*** corresponds to value read by sensor. This value can be different from value read in buffer solution.*

9. Allow time to stabilize value displayed; then, press **OK/RESET** button, display shows:

   Done, Press OK?

10. Press **OK/RESET** button, display shows:

    Save Changes Yes

11. Press **OK/RESET** button to finish sensor calibration.

2.5.9 Verification

1. Sensor still being in pH-10 buffer solution, control should display a pH of 10 (+/-0.10).
2. Take sensor out of the pH-10 buffer solution and rinse well, then, dip it in pH-4 buffer solution.
3. Wait for sensor to stabilize. Control should display a pH of 4 (+/-0.10).
4. Take sensor out of the solution and rinse well.
5. Take thermocouple out of the solution; rinse well before storing.

2.5.10 Disposal of Buffer Solutions Used for Calibration

1. Empty buffer solution from the two beakers, one after the other into a large quantity of cold water.
2. Check pH of this solution using control sensor just calibrated. If pH reading is $\leq$ 6 or $\geq$ 9.5, add $NaHCO_3$, a little at a time while stirring, until pH drops between 6 and 9.5, discard solution in the sink.
3. Rinse beakers well.
4. Rinse sensor well. Dab sensor tip with a soft lint-free cloth to remove excess of water.
5. Reinstall pH sensor on washer.
6. Refer to *ILLUSTRATED PARTS BREAKDOWN SECTION*, for correct sensor positioning. Improper reinstallation will result in faulty measurement.
7. End of calibration.

2.6 ENABLE/DISABLE PRINTER

Printer can be enabled or disabled in Mode Supervisor by supervisor or a technician.

1. On Mode Selection screen, press **OPTIONS** touch pad.
2. On Options screen, Press **SUPERVISOR MODE** touch pad. A numeric keyboard appears.
3. Enter supervisor or service password. Press **ENTER** touch pad.
4. Screen advances to the first supervisor screen.
5. Press **RIGHT** arrow to advance to next supervisor screen.
6. Press **PRINTER** touch pad.

   NOTE: ENABLED or DISABLED button appears on touch pad according to function status.

7. Press **X** touch pad to return to Options Screen.

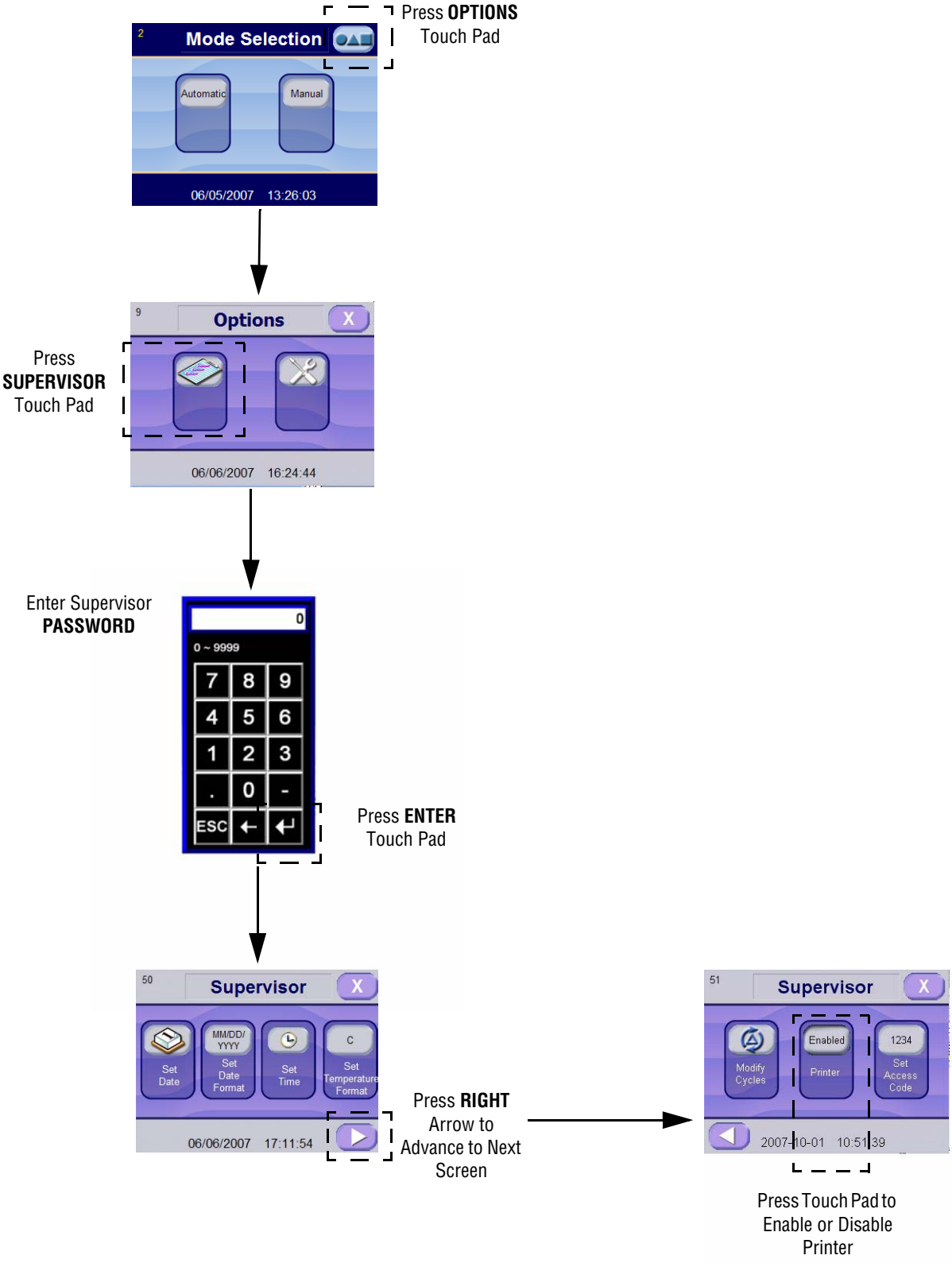


Figure 2-8. Enable/Disable Printer Flowchart

- **Service Printouts**

  See Figure 2-9.

  Printer Menu – Allows to generate printings for:

  NOTE: Printer Menu touch pad is available in Service Mode if printer is enabled (see SECTION 2.6, ENABLE/DISABLE PRINTER).

  Hardware Options – Pressing this touch pad generates a printout of unit configuration (serial number, door configuration, detergent conductivity option, vapor condenser, drain cooldown, heat exchanger, pH neutralization and heating source).

  System Options – Pressing this touch pad generates a printout of all unit values (Detergent monitor time, pH neutralization limits, etc.).

  Calibration Values – Pressing this touch pad generates a printout with calibration values for the pH sensor and conductivity sensor.

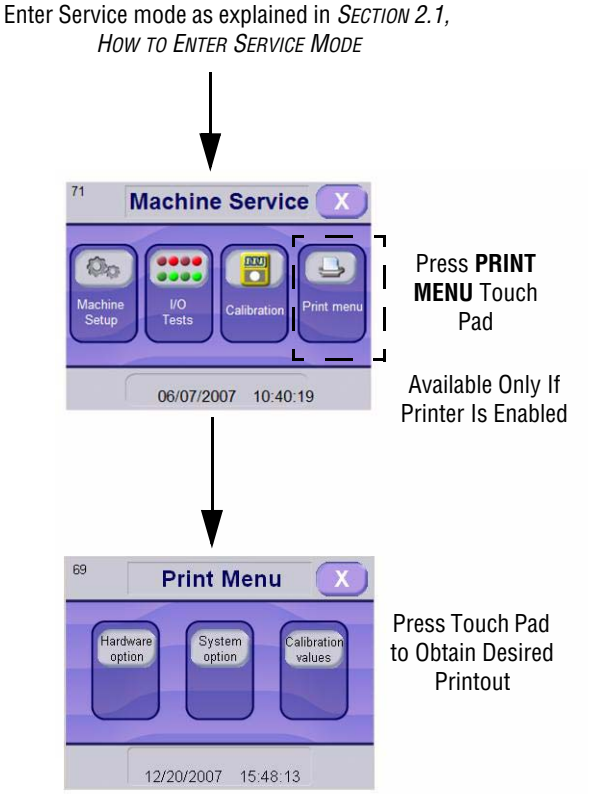


Figure 2-9. Printer Menus

2.7 SUPERVISOR PASSWORD MODIFICATION

Supervisor mode is password protected to prevent unauthorized changes to parameters of cycles and/or operating values by unauthorized operators.

Supervisor and a service technician can access supervisor mode. Only supervisor password can be modified, see Figure 2-10.

1. On Mode Selection screen, press **OPTIONS** touch pad.
2. On Options screen, press **SUPERVISOR MODE** touch pad. Numeric keyboard appears.
3. Enter supervisor password (1234 by default); then, press **ENTER** touch pad.
4. Screen advances to the first supervisor screen.
5. Press **RIGHT ARROW** to advance to next screen.
6. Press **SET ACCESS CODE** touch pad.
7. Numeric touch screen appears.
8. Enter new password. Password must be composed by four digits from 0 to 9999.
9. Press **ENTER** touch pad. Screen returns to supervisor screen.
10. Press **X** touch pad to return to Options screen.
11. Press **X** touch pad to return to Mode Selection screen.

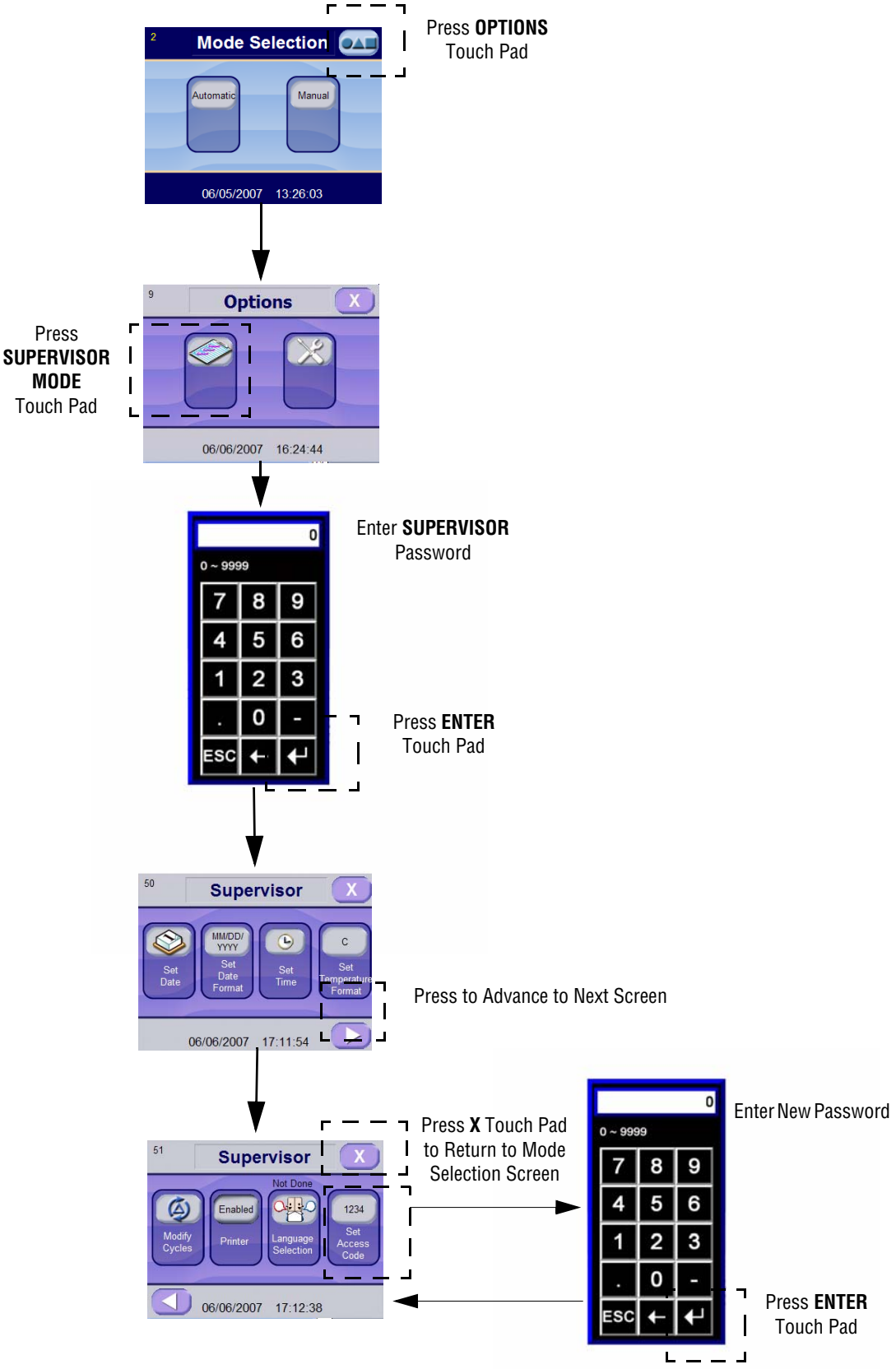


Figure 2-10. Supervisor Password Modification

Section 3: Principles of Operation

> ***IMPORTANT:*** *A listing of the Safety Precautions to be observed when operating and servicing this Cage and Rack Washer can be found in SECTION 1 of this manual. Do not operate or service the equipment until you have become familiar with this information.*

NOTE: For Service Mode adjustments, refer to SECTION 2, SERVICE MODE PROCEDURES.

3.1 START-UP CYCLE

During Start-Up cycle:

- all ball valves are closed;
- Thornton controller is initialized;
- alkaline tank monitor is started [if option applies, see *SECTION 3.14, ALKALINE WASH TANK MONITOR (IF OPTION APPLIES)*];
- acid tank monitor is started [if option applies, see *SECTION 3.15, ACID WASH TANK MONITOR*)].

3.2 TYPICAL CYCLE TREATMENTS

When washer starts processing a cage or rack, control energizes exhaust fan (6 out 7) during whole cycle. Exhaust fan is de-energized at end of cycle or when cycle is aborted.

3.2.1 Pre-Wash

Sump is filled with hot tap water. Water is recirculated. Then, water is drained.

3.2.2 Alkaline Wash

If alkaline side tank is present, sump is filled using alkaline side tank.

-- or --

Sump is filled with hot tap water.

Water is recirculated.

If alkaline side tank is present and water save is activated, water is returned to alkaline side tank.

-- or --

Water is drained.

3.2.3 Acid Wash

If acid side tank is present, sump is filled using acid side tank.

-- or --

Sump is filled with hot tap water.

Water is recirculated and heated. A soaking phase is performed.

If acid tank is present and water save is activated, water is returned to acid side tank.

-- or --

Water is drained.

3.2.4 Rinse 1

Sump is filled with hot tap water. Water is recirculated; then, water is drained.

3.2.5 Rinse 2

Sump is filled with hot tap water. Water is recirculated; then, water is drained.

3.2.6 Final Rinse

- Recirculated Final Rinse

  Sump is filled with hot tap water. Water is recirculated; then, water is drained.

- Non-Recirculated Final Rinse Treatment

  Water is sprayed over load (non-recirculated). Then water is drained.

3.2.7 Exhaust

An exhaust phase is performed.

3.3 PHASE PROCESSING

3.3.1 Sump Filling

- **Automatic Rack Flush:**

If automatic rack flush system option is available and performing final rinse, control energizes automatic water rack flush valve (6 out 0) during filling phase for recirculated final rinse or during nor-recirculation for the non-recirculated final rinse.

- **Filling Valve Opening:**

If sump is filled directly, control energizes sump hot water fill valve (4 out 1) and energizes heat exchanger steam valve (4 out 14) – if option applies and treatment temperature is over 165ºF.

If sump is filled using alkaline side tank, control opens alkaline tank dump ball valve (4 out 9).

If sump is filled using acid side tank, control opens acid tank dump ball valve (5 out 3).

- **Jet Ball Valve Opening:**

Control opens jet valve (4 out 2) during the whole filling phase to avoid build up of an air pocket in recirculation piping. Air pocket would prevent recirculation pump from priming.

- **Filling Completed:**

Once sump level detects water (1 in 8) for 3 consecutive seconds:

If sump is filled directly, control de-energizes sump hot water fill valve (4 out 1), and de-energizes heat exchanger steam valve (4 out 14) – if option applies and treatment temperature is over 165ºF (73.8ºC).

If sump is filled using alkaline side tank, control closes alkaline tank dump ball valve (4 out 9)

If sump is filled using acid side tank, control closes acid tank dump ball valve (5 out 3)

Control closes jet valve (4 out 2).

- **Filling Alarm:**

If after 5 minutes (default value adjustable in service mode only), sump level (1 in 8) does not detect water, control gives an alarm.

3.3.2 Recirculation

- **Initialization**

Control closes jet valve (4 out 2).

Control energizes header system (see *SECTION 3.11*, *HEADER SYSTEM*).

- **Recirculation Phase**

If water temperature is over 140°F [60ºC], damper (4 out 8) is opened. 5 seconds later(15 seconds if temperature is over 160°F [71.1ºC]), control energizes recirculation pump and jet valve. If damper was open, it closes 20 seconds after jet valve is opened.

If bottle wash is active, bottle wash valve (6 out 1) opens when damper closes.

If detergent injection is needed, detergent is injected (see *SECTION 3.4*, *DETERGENT INJECTION*).

Control energizes sump steam valve (4 out 3) and starts timer (time adjustable in automatic mode only for each treatment) for recirculation phase.

If treatment is heated: sump heater monitor is started (see *SECTION 3.5*, *SUMP HEATING MONITOR*).

If central header option is available and is used during cycle, see *SECTION 3.11*, *HEADER SYSTEM*.

If bottle wash option is available and is selected to run during cycle, see *SECTION 3.12*, *BOTTLE WASH OPTION*.

When recirculation time is elapsed, control de-energizes bottle wash ball valve [6 out 1] (only if option applies), header system and opens jet valve if it is not open.

- **Non-Recirculated Phase:**

If automatic rack flush system option is available; control energizes automatic water rack flush (6 out 0) during non-recirculation phase.

Control energizes non-recirculated final rinse fill valve (6 out 3), heat exchanger steam valve (4 out 14) and starts a 1:30 minute timer (default value adjustable in automatic mode only) for non-recirculation phase. Once non-recirculation phase is complete or sump level switch (1 in 8) detects water, control de-energizes non-recirculated final rinse fill valve (6 out 3), header system, heat exchanger steam valve (4 out 14) and automatic water rack flush (6 out 0).

3.4 DETERGENT INJECTION

3.4.1 Time Based Injection

Proper detergent pump is activated for selected time. If injection is paused, injection time is restarted when cycle is resumed.

3.4.2 Conductivity Injection

- **Non Guaranteed Treatment**

Proper injection pump is started.

When conductivity is reached, detergent pump is deactivated and control waits 10 seconds before allowing injection again. Conductivity setpoint is maintained all through recirculation phase.

If after 3 minutes (default value adjustable in service mode only) detergent concentration set point is not reached, control gives an alarm.

- **Guaranteed Treatment**

Sump heater monitor is started (see *SECTION 3.5*, *SUMP HEATING MONITOR*).

Control waits until temperature setpoint is reached.

Proper injection pump is started.

When conductivity is reached, detergent pump is deactivated and control waits 10 seconds before allowing injection again. Conductivity setpoint is maintained all through recirculation phase.

If after 3 minutes (default value adjustable in service mode only) detergent concentration set point is not reached, control gives an alarm.

3.5 SUMP HEATING MONITOR

If treatment temperature is guaranteed and sump water temperature set point is not reached, recirculation timer stops. Heating timer resumes.

If temperature is below treatment temperature +2°, control energizes sump steam valve until sump water temperature reaches treatment temperature set point +5°.

If after 10 minutes (default value adjustable in service mode only) sump water temperature set point is not reached and treatment temperature is guaranteed, control gives an alarm.

If treatment temperature is guaranteed and sump water temperature set point +0.5° is reached, control resumes recirculation timer.

3.6 SOAKING PHASE (ONLY FOR ACID WASH)

Control de-energizes recirculation pump, header system and starts a 1:30 minute timer (default value adjustable in automatic mode only) for soaking phase. Once soaking phase is complete, draining phase starts.

3.7 DRAINING PHASE

3.7.1 Cooldown

If no cooldown tank is present and neutralization is present (see *SECTION 3.9*, *SUMP PH NEUTRALIZATION*).

If guaranteed cool down tank option is available, control waits until cool down tank is empty before starting sump draining phase.

3.7.2 Header Drain

Once sump water is neutralized and/or recirculation phase is complete, control waits 10 seconds (default value adjustable in service mode only) to allow headers draining.

3.7.3 Sump Draining

Control closes jet valve, opens sump drain ball valve (4 out 0), energizes recirculation pump (4 out 4) for 1 minute (default value adjustable in service mode only). If drain cooling option is available, see *SECTION 3.10*, *GUARANTEED COOL DOWN TANK OPTION*.

3.7.4 Cooldown Tank Alarm (if option applies)

If cool down tank is present and cool down tank low level (1 in 12) doesn't detect water after 30 seconds, control gives an alarm.

If cool down tank high level (1 in 11) detects water during sump draining, control gives an alarm.

3.7.5 Draining Complete

Once draining phase is completed, control closes sump drain ball valve (4 out 0), de-energizes recirculation pump (4 out 4).

3.7.6 Draining Alarm

If sump level switch (1 in 8) still detects water, control gives an alarm.

3.7.7 Non Guaranteed Cooldown at the End of a Draining Phase

If cooldown drain option is available but not guaranteed and temperature is over 140°F, control de-energizes cooling drain valve.

3.8 WATER SAVE PHASE

3.8.1 Header Drain

Once recirculation phase is complete, 10 seconds later (default value adjustable in service mode only) headers drain.

Control closes drain valve (4 out 2).

3.8.2 Water Save Processing

If alkaline wash is processed, control opens alkaline tank return ball valve (4 out 11).

If acid wash is processed, control opens acid tank return ball valve (5 out 5).

Control energizes recirculation pump (4 out 14) for 1 minute (default value adjustable in service mode only).

If alkaline wash is processed, once draining phase is complete, control closes alkaline tank return ball valve (4 out 11).

If acid wash is processed, once draining phase is complete, control closes acid tank return ball valve (5 out 5).

Control de-energizes recirculation pump (4 out 4).

3.8.3 Exhausting Phase

Control energizes automatic damper (4 out 8) for 1:30 minute. Once exhaust phase is complete, control de-energizes automatic damper (4 out 8) and exhaust fan relay (6 out 7).

3.9 SUMP pH NEUTRALIZATION

During neutralization phase, control keeps recirculation pump (4 out 4) and header system energized. It also keeps jet valve opened.

NOTE: "inject", "containment", "wait" and "mix" time referred in the following section, are values that can be set in service mode. There is an "inject", a "containment" and a "wait" time for each neutralizer pump.

IF pH is not within the allowed range, appropriate pump is pulsed on and off until pH is within the allowed range.

The ON time of the pump is the "inject" time if treatment uses detergent and pH has not overshot. Otherwise, the "containment" time, which is a shorter injection time to prevent overshooting, is used.

The OFF time of the pump is the "wait" time.

IF pH is within the allowed range:

When pH value is within the allowed range, water is mixed for the "mix" time to ensure that water remains within the allowed range. If water gets out of the allowed range, control resumes injection.

If water is not within allowed pH range after 9 injections (default value adjustable in service mode) an alarm is generated.

3.10 GUARANTEED COOL DOWN TANK OPTION

3.10.1 Cooling Phase

If pH neutralization option (with pH meter controller) is available, cool down tank mixing motor relay (5 out 7) is used to accelerate process in cool down tank.

If water in cool down tank is above 140.0 °F [60.0 °C] (default value adjustable in service mode only). Control energizes drain cooling valve (4 out 13) for 3 minutes (default value adjustable in service mode only). Once water temperature in cool down tank has reached set point, control de-energizes drain cooling valve (4 out 13).

If after 3 minutes (default value adjustable in service mode only), water temperature in cool down tank is still above 140.0 °F [60.0 °C] (default value adjustable in service mode only), control gives an alarm.

If cool down tank high water level switch detects water (1 in 11) for 3 consecutive seconds but cool down tank low water level switch (1 in 12) does not detect water, control gives an alarm.

3.10.2 pH Neutralization Phase (pH Meter Controller)

During neutralization phase, control keeps cool down tank mixing motor relay energized.

NOTE: "inject", "containment", "wait" and "mix" time referred in the following section are values that can be set in service mode. There is an "inject", a "containment" and a "wait" time for each neutralizer pump.

IF pH is not within allowed range:

Appropriate injection pump is pulsed on and off until pH is within allowed range. The ON time of the pump is the "inject" time if the treatment uses detergent and pH has not overshot. Otherwise the "containment" time, which is a shorter injection time to prevent overshooting, is used.

The OFF time of the pump is the "wait" time.

IF the pH is within allowed range:

When pH value is within allowed range, water is mixed for the "mix" time to ensure water remains within allowed range. If water gets out of allowed range, control resumes injection.

If water is not within allowed pH range after 9 injections (default value adjustable in service mode) an alarm is generated.

3.10.3 Dumping Phase

Once water in cool down tank is below 140.0 °F [60.0 °C] (default value adjustable in service mode only) and/or neutralized (only if option applies), control energizes cool down tank drain ball valve (6 out 4) for 3 minutes (default value adjustable in service mode only). Once cool down tank draining phase is complete, control de-energizes cool down tank drain ball valve (6 out 4).

If after 3 minutes (default value adjustable in service mode only), cool down tank low water level switch (1 in 12) still detects water, control gives an alarm.

3.11 HEADER SYSTEM

Reversing Header System:

- **When Header System is not Fully Forward and is not Fully Reversed:**

If traveler forward limit switch does not detect header system in fully forward position (1 in 6) and traveler backward limit switch does not detect header system in fully backward position (1 in 7), control energizes traveler forward contactor (4 out 5) for 30 seconds (fixed value not adjustable). Once traveler forward limit switch detects header system in fully forward position (1 in 6), control de-energizes traveler forward contactor (4 out 5) for 2 seconds (default value adjustable in service mode only).

If after 30 seconds (fixed value not adjustable), traveler forward limit switch does not detect header system in fully forward position (1 in 6), control gives an alarm.

- **When Header System is in Fully Reverse Position:**

If traveler forward limit switch does not detect header system in fully forward position (1 in 6) but reverse limit switch detects header system in fully reverse position (1 in 7), control energizes header forward contactor (4 out 5) for 30 seconds (fixed value not adjustable). Once traveler forward limit switch detects header system in fully forward position (1 in 6), control de-energizes traveler forward contactor (4 out 5) for 2 seconds (default value adjustable in service mode only).

If after 30 second (fixed value not adjustable), traveler forward limit switch does not detect header system in forward position (1 in 6), control gives an alarm.

- **When Header System is in Fully Forward Position:**

If traveler backward limit switch does not detect header system in fully reverse position (1 in 7) but forward limit switch detects header system in fully forward position (1 in 6), control energizes header reverse contactor (4 out 6) for 30 seconds (fixed value not adjustable). Once traveler reverse limit switch detects header system in fully reverse position (1 in 7), control de-energizes traveler reverse contactor (4 out 6) for 2 seconds (default value adjustable in service mode only).

If after 30 second (fixed value not adjustable), traveler reverse limit switch does not detect header system in fully backward position (1 in 7), control gives an alarm.

- **Central Header (Option)**

Control opens jet suystem ball valve (4 out)2 and closes central header ball valve (6 out 2) until header system completes a full stroke (back and forth), then, opens central header ball valve and closes jet system ball valve for the next full rotation. Sequence repeats the entire duration of recirculation phase

3.12 BOTTLE WASH OPTION

Control alternates between bottle wash ball valve (6 out 1) and jet valve #1 (4 out 12) every 30 seconds during the whole recirculation phase. When switching from one valve to the other, both valves are open at the same time for 2 seconds to avoid having both valves closed, which can cause a water hammer.

3.13 WASHER MONITORING

- Monitored During Entire Cycle

If emergency cable system is pulled (1 in 0), control gives an alarm.

If an emergency button is pressed (1 in 2 for load side, 1 in 1 for unload side) control gives an alarm.

If a door is opened (1 in 4 for load door, 1 in 5 for unload door) control gives an alarm.

All washer outputs are de-energized.

3.14 ALKALINE WASH TANK MONITOR (IF OPTION APPLIES)

3.14.1 Alkaline Wash Tank Filling

If alkaline tank high level switch (1 in 9) indicates that alkaline wash tank is not full, control energizes alkaline tank fill valve (4 out 10) for 5 minutes (default value adjustable in service mode only) or until alkaline wash tank is full. Once alkaline wash tank high level switch detects water (1 in 9) for 3 consecutive seconds, control de-energizes alkaline tank fill valve (4 out 10).

3.14.2 Alkaline Wash Tank Filling Alarm

If after 5 minutes (default value adjustable in service mode only), alkaline tank high level switch does not detect water (1 in 9), control gives an alarm.

3.14.3 Alkaline Wash Tank Heating

Once alkaline wash tank is full, control energizes alkaline tank steam valve (4 out 12) to start heating alkaline wash tank water up to 140.0 °F [60.0 °C] (default value adjustable in service mode only) for 10 minutes (default value adjustable in service mode only). Once temperature set point is reached, control de-energizes alkaline tank steam valve (4 out 12).

3.14.4 Alkaline Wash Tank Heating Alarm

If after 10 minutes (default value adjustable in service mode only), alkaline wash tank water temperature is not reached, control gives an alarm.

3.15 ACID WASH TANK MONITOR

3.15.1 Acid Wash Tank Filling

If acid tank high water level switch (1 in 10) indicates that acid wash tank is not full, control energizes acid tank fill valve (5 out 4) for 5 minutes (default value adjustable in service mode only) or until acid wash tank is full. Once acid tank high water level switch detects water (1 in 10) for 3 consecutive seconds, control de-energizes acid tank fill valve (5 out 4).

3.15.2 Acid Wash Tank Filling Alarm

If after 5 minutes (default value adjustable in service mode only), acid tank high water level switch does not detect water (1 in 10), control gives an alarm.

3.15.3 Acid Wash Tank Heating

Once acid wash tank is full, control energizes acid tank steam valve (5 out 6) to start heating acid wash tank water up to 140.0 °F [60.0 °C] (default value adjustable in service mode only) for 10 minutes (default value adjustable in service mode only). Once temperature set point is reached, control de-energizes acid tank steam valve (5 out 6).

3.15.4 Acid Wash Tank Heating Alarm

If after 10 minutes (default value adjustable in service mode only), acid wash tank water temperature is not reached, control gives an alarm.

3.16 MISCELLANEOUS NOTES

3.16.1 Bypass Button

A BYPASS button is present on Cycle Status display. A cycle phase may be bypassed only if Temperature Guaranteed is not selected. Recirculation, soaking and exhaust phases can be bypassed. A message is printed when a phase is bypassed.

3.16.2 Extend Button

An EXTEND button is present on Cycle Status display. Pressing EXTEND button adds time to remaining phase time. E.g. if 1 minute remains from a 5 minute recirculation and the EXTEND button is pressed, the recirculation timer is extended to 6 minutes.

Recirculation, soaking and exhaust phases can be extended. A message is printed when a phase is extended.

3.17 MANUAL MODE DESCRIPTION

User or service technician can manually control certain washer functions by accessing Manual Control mode. Manual Control mode is accessible from Operating mode when washer is not in cycle. By pressing **MANUAL MENU** button, the following sequences are available in this mode:

3.17.1 Fill

By selecting FILL, filling port valve is activated and sump fills. Display shows FILLING SUMP. Once sump level reached, display shows SUMP FULL. If a door is opened or FILL button is pressed again, sequence is aborted. Filling valve closes automatically when sump is full.

3.17.2 Pump/DRV

By selecting PUMP/DRV the following sequence occurs: sump is filled; then, recirculation pump, jet valve and header system are activated. Display shows PUMPING/DRIVING.

If a door is opened or PUMP/DRV button is pressed again, the sequence is aborted.

3.17.3 Drive

By selecting DRIVE header system is activated. Display shows DRIVING. If DRIVE button is pressed again, sequence is aborted.

3.17.4 Drain

By selecting Drain, you can drain the following:

Sump

Acid Tank (appears only if option selected)

Alkaline Tank (appears only if option selected)

Cooldown (appears only if option selected)

- Sump

  Sump is filled to ensure pump does not run dry. Recirculation pump is activated and drain valve opens. Display shows DRAINING SUMP.

  Once drain time has elapsed, display shows SUMP EMPTY. If a door is opened or SUMP button is pressed again, sequence is aborted.

  If cooldown tank is present, this one is drained using manual cooldown tank draining sequence.

- Alkaline Tank

  Alkaline tank dump valve opens and sump is filled. When sump is full, alkaline tank dump valve is closed and sump is drained using manual sump draining sequence. This sequence is repeated until sump does not fill within tank drain time.

  If a door is opened or ALK. TANK button is pressed again, sequence is aborted.

  Once tank empty, display shows ALKALINE TANK EMPTY.

- Acid Tank

  Acid tank dump valve opens and sump fills. When sump is full, acid tank dump valve closes and sump is drained using manual sump draining sequence. This sequence is repeated until sump does not fill within tank drain time.

  If a door is opened or ACID TANK button is pressed again, sequence is aborted.

  Once tank is empty, display shows ACID TANK EMPTY.

- Cool down tank:

  Cooldown tank is drained as per guaranteed cooldown tank option section. This sequence cannot be aborted.

  NOTE: In this mode timers (filling/draining…) are set according to programmed Service Mode values.

Section 4: Inspection and Maintenance

IMPORTANT: *A listing of the Safety Precautions to be observed when operating and servicing this Cage and Rack Washer can be found in SECTION 1 of this manual. Do not operate or service the equipment until you have become familiar with this information.*

4.1 GENERAL

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:

- **Regularly scheduled preventive maintenance, in addition to faithful performance of minor maintenance described in this manual, is required for safe and reliable operation of this equipment. Contact STERIS to schedule preventive maintenance.**
- **Only STERIS or STERIS-trained service technicians should make repairs and adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel or installation of unauthorized parts could cause personal injury, invalidate warranty or result in costly damage. Contact STERIS regarding service options.**

WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD:.

- **Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.**
- **Fasteners and star washers are used to ensure protective bonding continuity. Always reinstall any star washer which may have been removed during installation or servicing.**

The sample preventive maintenance guide included in this section (**Table 4-1**) should be used as a guideline for determining the frequency of preventive maintenance. This will prove useful in helping ensure proper maintenance of your washer.

Maintenance procedures described in this section must be performed as required at the suggested frequency. The indicated frequencies are minimums and can be changed if washer use warrants.

If a problem occurs, refer to *SECTION 5, TROUBLESHOOTING*.

Refer to *ILLUSTRATED PARTS BREAKDOWN*, of this manual for recommended spare parts list.

4.2 PREVENTIVE MAINTENANCE SCHEDULE

It is important, for proper and efficient operation of washer, to set up a schedule of periodic inspection and maintenance following established institutional practices. Close attention should be paid to conditions in operating environment which will affect frequency of some maintenance procedures indicated (e.g., mineral content of water supply, washer usage).

The following schedule should be used as a guide to properly maintain washer. These procedures should be carried out only by qualified service technicians. Contact STERIS when service is required.

Table 4-1. Preventive Maintenance Schedule

Recommended frequency of inspection is indicated in the right column. Usage and utility conditions may require more or less frequent inspections.		**Suggested Frequency**
1.0	**PREPARATION FOR PREVENTIVE MAINTENANCE**	
1.1	Discuss equipment operation with department personnel.	6 x/yr
1.2	Inspect printouts for signs of trouble.	6 x/yr
1.3	If required, install test equipment.	A/R
1.4	Before servicing equipment, use Lockout-tagout practices. Always follow local occupational health and safety regulations as well as electric and plumbing codes.	every inspection

Service Charges may be incurred. Consult your warranty for details

Table 4-1. Preventive Maintenance Schedule (Cont'd)

Recommended frequency of inspection is indicated in the right column. Usage and utility conditions may require more or less frequent inspections.		Suggested Frequency
1.0	**PREPARATION FOR PREVENTIVE MAINTENANCE (Cont'd)**	
1.5	When necessary, shut off all building services and drain lines	A/R
1.6	Verify equipment disconnect device is within easy reach and accessible to operator at all times.	every inspection
2.0	**PLC CONTROL AND PRINTER**	
2.1	Replace PLC battery as required.	A/R
2.2	Inspect printer for proper operation.	6 x/yr
2.3	Check printout for darkness, missing dots, etc.	6 x/yr
2.4	Verify paper take up is working properly.	6 x/yr
2.5	Verify current date and time are displayed; if not, reset time and date.	6 x/yr
2.6	Inspect touch screens for proper operation.	6 x/yr
2.7	Calibrate conductivity and pH set points.	4 x/yr
2.8	Replace printer paper and ribbon as needed.	A/R
3.0	**DOOR ASSEMBLY (EACH DOOR)**	
3.1	Inspect door(s) for ease of operation.	6 x/yr
3.2	Verify operation of door safety switch. Adjust if necessary.	2 x/yr
3.3	Verify operation of interlock system. Adjust if necessary.	2 x/yr
3.4	Inspect condition of door gasket for wear. Replace if necessary.	1 x/yr
3.5	Verify door glass for cracks and leaks. Replace if necessary.	6 x/yr
4.0	**CHAMBER COMPONENTS**	
4.1	Verify sump under floor sections for debris. Use a hose to clean if necessary.	12 x/yr
4.2	Remove hard water deposits from sump, chamber interior, and accessories.	12 x/yr
4.3	Verify condition of washer accessories. Replace or clean as necessary.	6 x/yr
4.4	Inspect condition of water level. Clean if necessary.	6 x/yr
4.5	Verify interior light. Replace if necessary.	6 x/yr
4.6	Ensure tempered glass is securely fixed.	6 x/yr
4.7	If option is present, inspect condition of pan washing rack.	6 x/yr
4.8	Check piping system for leaks. Repair if necessary.	6 x/yr
4.9	Verify pump suction strainer for debris. Clean if necessary.	6 x/yr
4.10	If option is present, verify connections between riser valve and feeder bottle cart is secure.	3 x/yr

Service Charges may be incurred. Consult your warranty for details

Table 4-1. Preventive Maintenance Schedule (Cont'd)

Recommended frequency of inspection is indicated in the right column. Usage and utility conditions may require more or less frequent inspections.		**Suggested Frequency**
5.0	**CARRIAGE SYSTEM**	
5.1	Inspect spray jets. Align and clean if necessary.	once a week
5.2	Inspect spray headers. Flush out if necessary.	once a week
5.3	Inspect oscillating carriage drive and clutch system. Test clutch for slippage. Adjust if necessary.	6 x/yr
5.4	Verify drive cable rollers for wear. Replace if necessary.	6 x/yr
6.0	**EACH SUPPLY-LINE STRAINER**	
6.1	Inspect supply-line strainers for debris. Clean as necessary.	6 x/yr
6.2	Check for leaks on all lines. Tighten all unions if necessary.	6 x/yr
7.0	**EACH STEAM TRAP**	
7.1	Inspect steam trap for proper operation. Rebuild steam trap if necessary.	6 x/yr
7.2	Verify condition of insulation on steam lines. Replace if necessary.	6 x/yr
8.0	**AUTOMATIC DETERGENT INJECTION SYSTEM**	
8.1	Inspect and lubricate detergent supply and injection hose. Replace if necessary.	6 x/yr
8.2	Lubricate chemical injection pump rollers.	6 x/yr
8.3	Verify pickup tubes screen for debris. Clean as necessary.	3 /yr
8.4	Verify amount of detergent injected.	3 x/yr
9.0	**PUMP MOTOR**	
9.1	Verify proper pump rotation.	6 x/yr
9.2	Inspect for noise and vibration.	6 x/yr
9.3	Inspect pump seal for leakage. Replace if necessary.	6 x/yr
9.4	Grease pump motor bearings where applicable.	once a week
9.5	Replace all quick disconnect clamp connection gaskets	6 x/yr
9.6	Tighten all quick disconnect clamps	6 /yr
10.0	**SELF- CLEANING FILTER**	
10.1	Inspect self-cleaning filter. Disassemble and remove debris from screen as necessary.	12 x/yr
11.0	**OPTIONAL EXHAUST FAN**	
11.1	Grease fan bearings in two locations.	once a week

Service Charges may be incurred. Consult your warranty for details

Table 4-1. Preventive Maintenance Schedule (Cont'd)

Recommended frequency of inspection is indicated in the right column. Usage and utility conditions may require more or less frequent inspections.	**Suggested Frequency**
12.0 ELECTRICAL CONTROL BOX	
12.1 Verify all sockets for proper seating of electrical components.	every inspection
12.2 Inspect wiring, terminals and socket connections for damage or fraying.	every inspection
13.0 SAFETY FEATURES	
13.1 Verify warning plates inside wash chamber for legibility. If worn out, broken or no longer legible, replace with new ones.	6 x/yr
13.2 Verify operational test on each safety cable while washer is operating. Verify each cable has a minimum of 2" of free play. Adjust if necessary.	6 x/yr
14.0 FINAL TEST	
14.1 Clean lint and dirt from components.	every inspection
14.2 Verify work area to ensure removal of all material used during inspection.	every inspection
14.3 Install any panel or cover removed during inspection.	every inspection
14.4 Unlock electrical disconnect switch to ON, and turn all utilities back ON.	every inspection
14.5 Test unit operation.	every inspection

Service Charges may be incurred. Consult your warranty for details

4.3 DAILY CLEANING PROCEDURES

⚠ WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: Always wear appropriate Personal Protective Equipment (PPE) when cleaning or removing debris from bottom of wash chamber and over suction plate.

⚠ WARNING – PERSONAL INJURY HAZARD: Never perform cleaning of wash chamber until full cycle has been completed, contaminated debris or water may remain in the bottom of the wash chamber.

⚠ WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD: Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

⚠ WARNING – BURN HAZARD: Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.

1. After last cycle of day, allow unit to cool, wearing appropriate Personal Protective Equipment (PPE) enter wash chamber and then remove and clean suction pump strainer as follows:
   a. Remove floor gratings in wash chamber.
   b. Loosen hose clamps and pull strainer straight out.
   c. Rinse strainer under a forceful stream of water to remove all soil and debris. Always clean filters while still wet before foreign matter dries.
   d. Replace suction pump strainer in chamber sump and tighten hose clamps.
2. Remove riser valve and inspect for debris. Brush off and rinse under tap water if necessary.

4.4 WEEKLY CLEANING PROCEDURES

4.4.1 Clean Washer Exterior

⚠ WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD: Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

⚠ CAUTION – POSSIBLE EQUIPMENT DAMAGE: Use nonabrasive cleaners when cleaning unit. Follow directions on containers and rub in a back-and-forth motion (in same direction as surface grain). Abrasive cleaners will damage stainless steel. Cleaners rubbed in a circular motion or applied with a wire bush or steel wool will scratch and dull stainless steel. Do not use these cleaners on painted surfaces.

Clean washer exterior with a general purpose cleaner to remove general stains, a stainless-steel stain remover for stubborn stains, and a stainless-steel polish to keep equipment looking new.

1. Using a damp cloth or sponge, apply cleaner in a back-and-forth motion, in same direction as surface grain.
2. Thoroughly wipe off cleaner.
3. Polish surface with a clean, dry, and lint-free cloth.
4. Clean door windows, with a general window cleaning product.
5. Dry window with a lint-free cloth.

4.4.2 Clean Washer Interior

⚠ WARNING – BURN HAZARD: Never perform cleaning of wash chamber until full cycle has been completed. If cycle has not been completed, contaminated debris or water may remain in the bottom of the wash chamber.

Wearing appropriate Personal Protective Equipment (PPE), enter wash chamber and proceed as follows:

1. Wash chamber with a mild detergent solution.
2. Rinse with tap water and dry with a lint-free cloth.
3. If interior is stained, use a general purpose cleaner to remove general stains or a stainless-steel remover for stubborn stains, as follows:
   a. Using a damp cloth or sponge, apply cleaner in a back-and-forth motion, in same direction as surface grain.
   b. Thoroughly wipe off cleaner.
   c. Polish surface with a clean, dry, lint-free cloth.
   d. Clean door windows with a general window cleaning product.
   e. Dry window with a lint-free cloth.

4.4.3 Clean Spray Jets and Headers

1. Observe jet nozzles during unit operation and inspect each nozzle to detect debris.
2. Insert a wire (smaller diameter than a jet nozzle) into spray nozzles, and push debris through nozzles into header.
3. Remove flush plug from bottom of each spray header (see Figure 4-1).

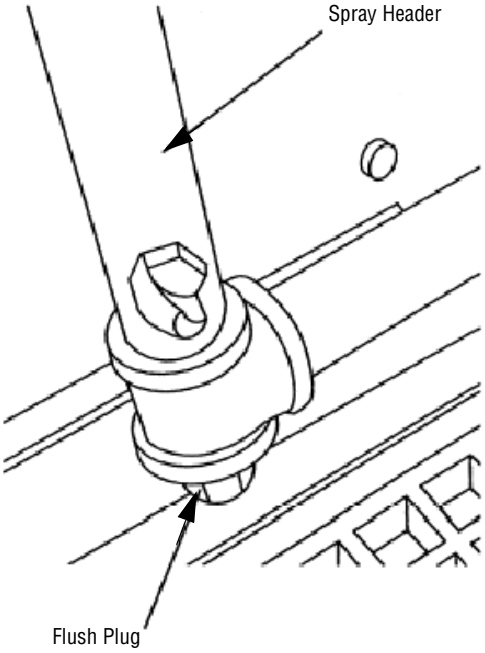


Figure 4-1. Spray Header Flush Plug

4. Manually fill sump with water and run pump for 30 seconds to flush loosened debris from spray headers.
5. Replace flush plugs.

4.4.4 Inspect Self-Cleaning Screen

⚠ WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD: Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

⚠ WARNING – BURN HAZARD:

- **Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.**
- **Pipes may be extremely hot.**

NOTE: A STERIS or STERIS-trained service technician is required to perform this task. Contact STERIS for this service. Preventive maintenance is not covered under warranty.

IMPORTANT: *Intake filter requires periodic inspection and replacement. Initial inspection is suggested once a week; user should determine frequency thereafter.*

1. Lock disconnect switch in OFF position and close building supply valves.
2. Allow unit to cool down.
3. Remove quick disconnect clamps located directly on filter assembly (see Figure 4-2).

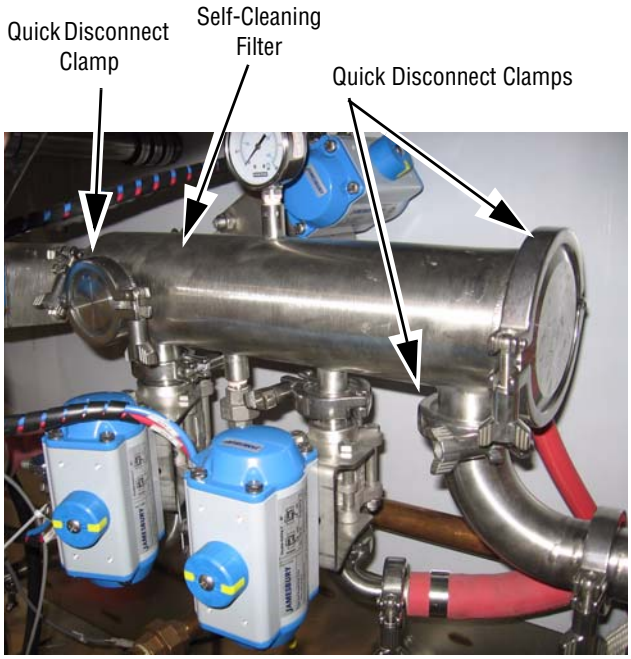


Figure 4-2. Self-Cleaning Screen

4. Remove filter cartridge by pulling straight out on handle.
5. Brush and rinse surface of filter cartridge to remove any debris. Inspect O-ring for damage.
6. Rinse filter under running water.
7. Reinsert filter cartridge. Reposition gaskets, quick disconnect clamps, and tighten.

8. Gasket should last for several inspection procedures. When necessary, order replacement gasket (P117951-568 and P117951-392) from STERIS.
9. Re-energize washer utilities.

4.5 MONTHLY CLEANING PROCEDURES

⚠ WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin or attempt to swallow. Read and follow the precautions and instructions on the detergent label and in the Material Safety Data Sheet (MSDS) prior to handling the detergent, refilling the detergent container or servicing the detergent injection pump. Wear appropriate Personal Protective Equipment (PPE) whenever handling the detergent or servicing the detergent injection pump and lines.

⚠ WARNING – SLIPPING HAZARD: To prevent slips, keep floor dry. Promptly clean up any spills or condensation. If spilled liquids are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label/or Material Safety Data Sheet (MSDS).

- **Remove Hard Water Deposits From Chamber and Accessories**

NOTE: Depending on hardness of water being used, it may be necessary to remove hard water deposits more often. Remove deposits from chamber and material handling accessories whenever deposits become visible.

1. Open chamber door. If desired, place empty wash cart(s) and accessories in chamber.
2. Turn OFF detergent supply pump (optional or by others).
3. Pour 1 gal (3.8 L) of descaling liquid into chamber sump. Exit chamber and close door.
4. Press **MANUAL** touch pad to access Manual Control mode.
5. Select and start **PUMP & DRIVE** function.
6. Let washer run for 15 minutes, then press **PUMP & DRIVE** touch pad.
7. Once hard water deposits are removed, select and start DRAIN function to drain descaler solution from sump.
8. Manually fill and drain chamber sump again to remove any residue.
9. Press **X** touch pad to exit Manual Control mode and turn ON detergent pump.

4.6 ROUTINE MAINTENANCE

⚠ WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD: Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

⚠ WARNING – BURN HAZARD: Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.

4.6.1 Grease Exhaust Fan Bearings

Exhaust fan bearings must be greased once a week as follows:

1. Locate remote exhaust fan grease fittings (see Figure 4-3).
2. Apply a high temperature, water-resistant grease (P117951-457).

NOTE: If a standard temperature grease is used, fan bearings must be greased once at end of each day.

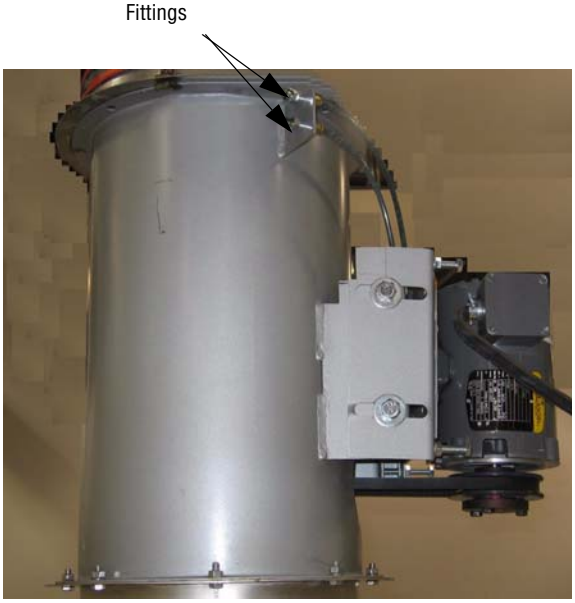


Figure 4-3. Exhaust Fan Grease Fittings

4.6.2 Clean Drain Discharge Side Tanks

⚠ WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD: Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

⚠ WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: Detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin or attempt to swallow. Read and follow the precautions and instructions on the detergent label and in the Material Safety Data Sheet (MSDS) prior to handling the detergent, refilling the detergent container or servicing the detergent injection pump. Wear appropriate Personal Protective Equipment (PPE) whenever handling the detergent or servicing the detergent injection pump and lines.

⚠ WARNING – BURN HAZARD: Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.

Side tanks must be cleaned once every two months using Manual Control mode as follows:

1. Press **MANUAL** touch pad to access Manual Control mode and display menu of available manual functions.
2. Press **DRAIN** touch pad to select DRAIN function.
3. A menu screen appears listing chamber sump and other washer tanks which may be drained using this function.
4. Press **ALKALINE TANK** or **ACID TANK** touch pad to begin draining corresponding tank.
5. Allow tank to drain.
6. Lock disconnect switch in OFF position and close building supply valves.
7. Open manual drain valve (see Figure 4-4) to allow any remaining liquids to drain.
8. Lift off tank cover and flush out tank by spraying inside of tank with a hose. Allow tank to drain and replace tank cover.
9. Close drain valve.
10. Repeat procedure for each tank.
11. Re-energize washer utilities.

- **Side tank with guaranteed temperature (option):**

Partially drain side tank using Manual Control mode as follows:

1. Press **MANUAL** touch pad to access Manual Control mode.
2. Press **DRAIN** touch pad function.
3. A menu screen appears listing chamber sump and other washer tanks which may be drained using this function.
4. Press **COOLDOWN** touch pad to begin draining cooldown (drain discharge) tank.
5. Allow tank to partially drain, then press **COOLDOWN** touch pad to stop cooldown tank draining.
6. Lock disconnect switch in **OFF** position and close building supply valves.
7. Lift off cover and flush out tank spraying inside of tank with a hose.
8. Replace tank cover and re-energize washer utilities.
9. Resume draining side tank.
10. When draining is complete, screen returns to drain menu.
11. Press **X** touch pad to return screen to manual function menu.
12. Press **X** touch pad to return to Mode Selection screen.

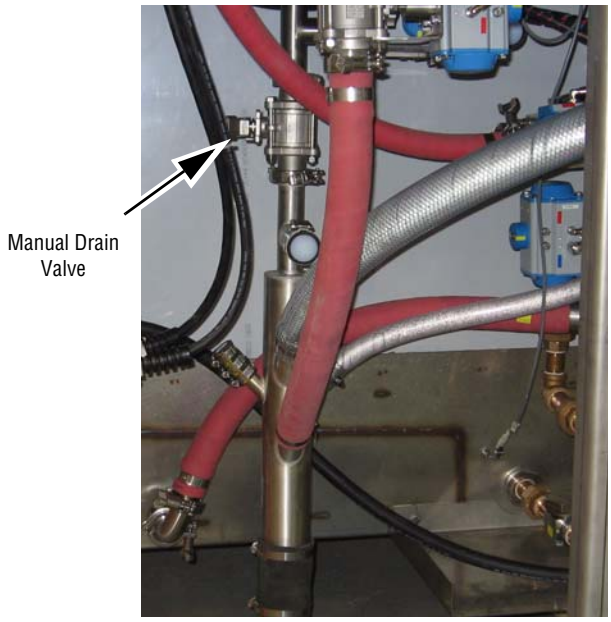


Figure 4-4. Manual Drain Valve

4.6.3 Clean Drain Discharge Temperature Control Probe

⚠ WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD: Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

⚠ WARNING – BURN HAZARD:

- **Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.**
- **Pipes may be extremely hot.**

⚠ WARNING – CHEMICAL BURN AND/OR EYE INJURY HAZARD: Wear appropriate Personal Protective Equipment (PPE) including gloves and eye protection when using a descaling product. Avoid contact with eyes or skin. If chemical product was swallowed or in contact with eyes or skin, read and follow precautions and instructions on detergent label and in Material Safety Data Sheet (MSDS) and seek medical attention immediately.

- Temperature control probe must be cleaned once every month as follows:

1. Drain discharge side tank using Manual Control mode.
2. Lock disconnect switch in OFF position and close building supply valves.
3. Locate temperature control probe along side of discharge tank.
4. Loosen compression fitting nut and remove probe from discharge tank.
5. Using a rag dampened with acid or descaler, remove hard water deposits and debris from probe.
6. Reinstall probe and tighten compression fitting nut.
7. Re-energize washer utilities.

4.6.4 Replace Detergent Squeeze Tube

⚠ WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:

- **Detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin or attempt to swallow. Read and follow the precautions and instructions on the detergent label and in the Material Safety Data Sheet (MSDS) prior to handling the detergent, refilling the detergent container or servicing the detergent injection pump. Wear appropriate Personal Protective Equipment (PPE) whenever handling the detergent or servicing the detergent injection pump and lines.**
- **Wear appropriate Personal Protective Equipment (PPE) when removing clamps and replacing squeeze tubes. If chemical contacts skin or eyes, immediately flush with running water for at least 10 minutes. If contact was with eyes, seek medical attention.**

⚠ CAUTION – POSSIBLE EQUIPMENT DAMAGE: Always use a silicone lubricant to lubricate squeeze tubes. Petroleum-based lubricants, such as Vaseline®[1] or grease, will cause squeeze tube to melt.

Replace detergent squeeze tube as follows:

1. Lock disconnect switch in OFF position and close building supply valves.
2. Locate detergent supply pump.
3. Remove clamps and disconnect supply and injection hoses from squeeze tube (see Figure 4-5)
4. Remove screws from pump cover and lift off pump cover.
5. Grasp one end of squeeze tube and pull tube out of pump. Discard tube.

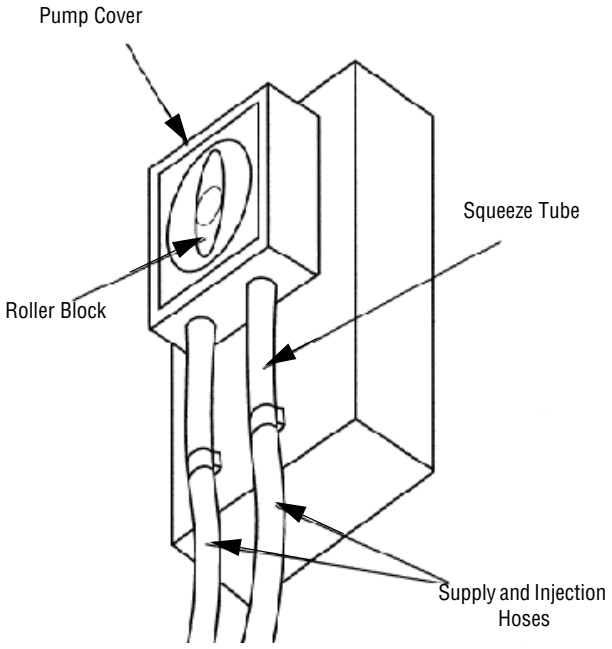


Figure 4-5. Replace Squeeze Tube

[1] *Vaseline is a trademark of Chesebrough Pond's Incorporated.*

6. Clean all pump surfaces.
7. Lubricate new squeeze tube (P177950-583). Liberally apply lubricant (P117950-599) over tube surface to within 2" [51 mm] of each end.
8. Insert one end of squeeze tube into pump. Feed tube through pump by manually rotating roller block.
9. Spread lubricant over rollers in roller block.
10. Replace pump cover and fasten with screws previously removed.
11. Connect supply and injection hoses to ends of squeeze tube and attach clamps.
12. Re-energize washer utilities.

4.6.5 Replacing Detergent Container

⚠ WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD:.

Washer chemicals are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin, or attempt to swallow. Read and follow precautions and instructions on chemical label and in Material Safety Data Sheet (MSDS) prior to handling detergent containers, or servicing detergent injection pumps, tank, and lines. Wear Personal Protective Equipment (PPE) whenever handling chemicals or servicing chemical injection pumps, tank, and lines.

⚠ WARNING – SLIPPING HAZARD: To prevent slips, keep floor dry. Promptly clean up any spills or condensation. If spilled liquids are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label/or Material Safety Data Sheet (MSDS).

⚠ CAUTION – POSSIBLE EQUIPMENT DAMAGE:

- **When choosing a detergent, select one with a low chloride content. Detergents with a high chloride content can corrode stainless steel.**
- **Always use non-foaming chemical for effective cleaning and proper pump and water level control operation. Follow manufacturer's recommendations for amount of chemical to be used.**

To achieve maximum cleaning efficiency, select a chemical appropriate to soil type being processed. Always follow chemical manufacturer's recommendations for amount of chemical to be used.

NOTE: Always use a non-foaming chemical for effective cleaning and proper pump operation.

When chemical is low or has run out:

1. Remove pickup tube and level sensor assembly from empty container and remove container.
2. Install a new container.
3. Insert pickup tube and level sensor vertically into new container.

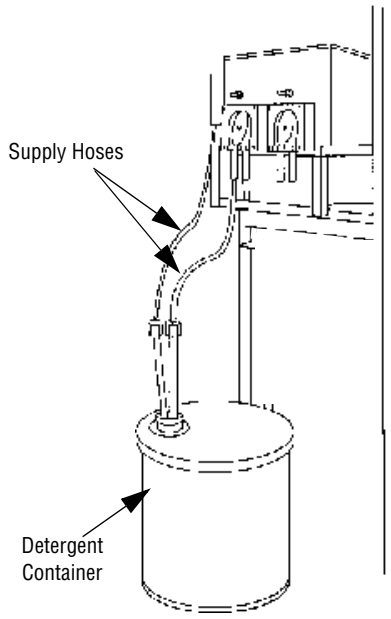


Figure 4-6. Replacing Detergent Container

4.7 PRINTER PAPER

- Changing Printer Paper Roll

1. Press on the dots on printer cover to release latch; pull cover out towards you to completely disengage cover; and then gently swing it down 180° until it rests against equipment panel.
2. Press on the indentation on the right side-wall of paper cover, gently pull to release, and swing door to the left until it is open (see Figure 4-7).
3. Cut leading edge of paper roll straight and square with the sides as shown on Figure 4-8.
4. Mount paper roll on paper-roll-holder, two plastic protrusions shaped like domes, inside paper compartment. Paper must curl up as shown in Figure 4-9. Paper roll core must properly align with paper-roll-holder. Make sure paper-roll-holder fits inside paper core and paper roll can turn freely.
5. Hold both edges of paper and insert it straight into paper slot of printer mechanism. Printer feeds paper automatically.

6. Press FEED Button to get desired length of paper fed through mechanism. Do not pull paper in either direction through printer mechanism (see Figure 4-10).
7. Remove take-up spool and insert leading edge of paper into slit on its shaft. Wrap paper around spool two or three times tightly and install take-up spool in printer. First make sure that gear on take-up spool aligns with gear on printer and then press the other end of shaft so it snaps in on metal frame.
8. Close paper cover and then close front cover.

NOTE: When changing paper roll, take note of the following:

1 Use a paper that meets printer specifications.

2 Do not use a paper that is glued to core.

3 Do not fold leading edge of paper when you use a new roll.

4) Do not operate printer without paper or ribbon; this leads to rapid deterioration of print head.

5) Do not use any sharp object to remove paper jams.

6) Do not pull on paper while printer is printing.

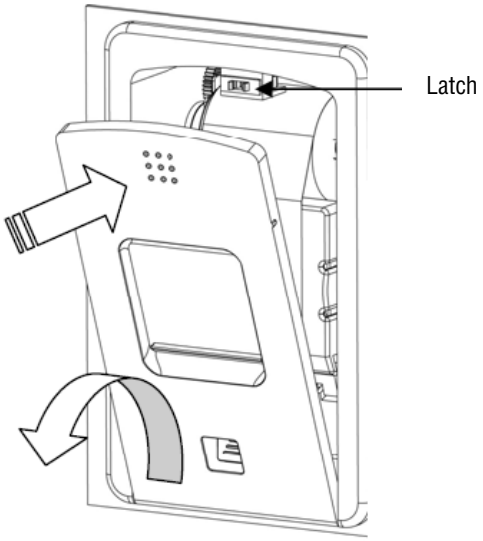


Figure 4-7. Open Printer Cover

Figure 4-8. Cut Paper Edge

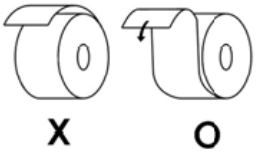


Figure 4-9. Install Paper Roll

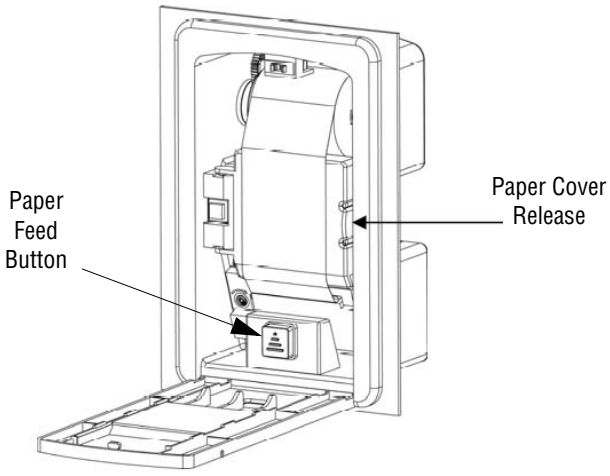


Figure 4-10. Paper Cover Compartment

4.8 CHANGING PRINTER RIBBON CARTRIDGE

1. Open printer front cover.
2. Remove paper from inside. Do not pull paper out. Use a pair of scissors to cut paper, where it feeds inside mechanism and use Paper Feed Button to remove remaining paper in printer.
3. Remove old cartridge by pressing cartridge, where marked PUSH, on right side.
4. Turn Ink Cartridge Knob in direction of arrow, to take up any slack in ribbon.
5. Place new cartridge on mechanism so ribbon aligns between print head and platen. Push down until it clicks in.
6. Turn Ink Cartridge Knob in direction of arrow a few times to take up any slack and ensure ribbon is installed properly without wrinkles or creases.

NOTE: When changing ribbon cartridge, note the following:

1) Ensure the power is turned off when replacing the ribbon cartridge.

2) Replace the ribbon cartridge before it is completely worn out and dry.

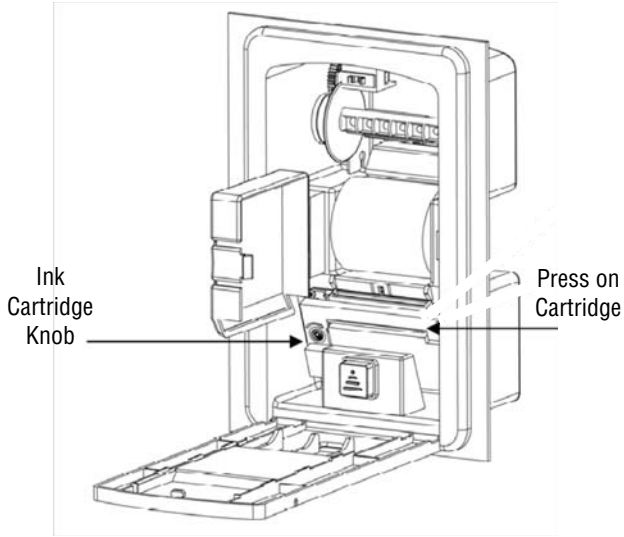


Figure 4-11. Changing Printer Ribbon Cartridge

Section 5: Troubleshooting

IMPORTANT: *A listing of the Safety Precautions to be observed when operating and servicing this Cage and Rack Washer can be found in SECTION 1 of this manual. Do not operate or service the equipment until you have become familiar with this information.*

5.1 TROUBLESHOOTING

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: Only STERIS or STERIS-trained service technicians should make repairs and adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel or installation of unauthorized parts could cause personal injury, invalidate warranty or result in costly damage. Contact STERIS regarding service options.

WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD:

- **Fasteners and star washers are used to ensure protective bonding continuity. Always reinstall any star washer which may have been removed during installation or servicing.**
- **Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.**

WARNING – SLIPPING HAZARD: To prevent slips, keep floor dry. Promptly clean up any spills or condensation. If spilled liquids are detergents or other chemicals, follow safety precautions and handling procedures set forth on detergent or chemical label/or Material Safety Data Sheet (MSDS).

This section contains detailed information on the types of washer malfunctions likely to occur, and possible causes and corrective actions.

If you are unable to correct the problem with use of the following Troubleshooting Charts, or if a problem occurs that is not described on the chart, please call STERIS. A factory-trained technician will promptly place your washer in proper working condition.

NOTE: Never permit unqualified persons to service the washer.

Table Descriptions

Table 5-1 – Troubleshooting Chart - Situations where NO Alarm or Printout occur.

Table 5-2 – Fault Chart - Faults where alarm and/or printout occur.

Table 5-1. Troubleshooting Chart

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
1. No power, screen is blank.	1. Building electrical supply disconnect switch (circuit breaker) **OFF** – position switch to **ON**. 2. Fuse in power circuit failed – check and/or replace fuse (FU4, FU7, FU10 [load side], FU11 [unload side]. 3. Transformer failed – replace transformer (TF1). 4. Replace display (touch screen).
2. Cycle does not start when **START** touch pad is pressed.	1. Chamber doors open – close and latch doors. 2. Hot water supply valve closed – open building and washer supply valves. 3. Faulty door and safety switch – replace safety switch. 4. Faulty touch screen – replace.
3. Doors open once cycle is started.	1. Exhaust dampered too much – adjust automatic damper. 2. Door latch misadjusted – adjust latch.
4. Too much water entering chamber. Water overflowing from drip gutter.	1. Water level malfunction – verify operation of water level. Clean or replace as necessary. 2. Fill solenoid valve remains open – repair or replace valve as necessary.
5. Detergent tank overfilling.	1. Water level malfunction – verify operation of water level. Clean or replace as necessary. 2. Fill solenoid valve remains open – repair or replace valve as necessary. 3. Drain line clogged – flush out line. 4. Return valve misaligned – check operation of valve. Repair or replace as necessary.
6. Water leaks from washer.	1. Chamber door(s) not fully closed – close and latch door(s). 2. Door gasket worn or defective – replace gasket. 3. Window gasket worn or defective – replace gasket. 4. Spray jets misaligned – realign jets away from doors. 5. Water level malfunction – verify operation of water level. Clean or replace as necessary. 6. Too much water entering chamber – refer to Problem #4. 7. Piping leaks – check hose clamps, valves, and piping. Tighten connections as necessary. 8. Exhaust dampered too much – adjust automatic damper. 9. Building vent connections inadequate – increase CFM capabilities.

Table 5-1. Troubleshooting Chart

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
7. Vapor escaping under door(s).	1. Exhaust dampered too much – adjust automatic damper. 2. Optional exhaust system OFF – verify operation of applicable option. 3. Optional exhaust fan rotating in wrong direction – reverse fan rotation. 4. Building vent connections inadequate – increase CFM capabilities.
8. Pump starts before appropriate sump water level is reached.	Water level malfunctions – verify operation of water level. Clean or replace as necessary.
9. Pump runs with insufficient or no pump pressure.	1. Pump suction strainer clogged – clean strainer. 2. Water level ball float malfunctions – verify operation of float ball. Clean or replace as necessary. 3. Water temperature in excess of 195°F (91°C) – lower temperature setpoint. 4. Self-cleaning screen clogged – remove debris from screen. 5. Loose hose connection on pump suction strainer – tighten hose clamps or replace as necessary. 6. Pump rotating in wrong direction – verify pump rotation as indicated by arrow. 7. Foam in chamber – rinse chamber with cold water and decrease detergent injection rate. 8. Compression fitting on pump RTD, located in suction pick-up pipe, is leaking air – inspect for leaks and improper installation. Seal leaks or correct installation as necessary.
10. Carriage drive system not operating properly.	1. Drive clutch loose – tighten clutch to specifications. 2. Spray headers hitting sealing strips covering vertical panel joints – adjust headers as necessary. 3. Drive cable loose or broken – tighten or replace cable as necessary.
11. Washer operation stops during cycle.	1. Loose connection in control wiring – inspect all control wiring connections and tighten if necessary. 2. Electrical component failure (e.g. motor starter) – replace applicable component. 3. Control fuse failed – replace fuse.
12. Foam in chamber.	1. Detergent is foaming – use recommended products. 2. Too much detergent injected during Wash phase – verify injection rate.

Table 5-1. Troubleshooting Chart

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
13. Chamber does not drain properly. *NOTE: 1 to 2" inches of water remain in sump after draining.*	1. Self-cleaning screen clogged – remove debris from screen. 2. Drain line clogged – flush out line. 3. Defective drain valve – repair or replace valve as necessary. 4. Drain time set too short – lengthen programmed drain time to approximately 15 seconds past pressure drop.
14. Load comes out dirty.	1. Empty detergent container – replace container. 2. Incorrect detergent used – use recommended products. 3. Spray jets clogged – clean jets. 4. Pump suction strainer clogged – clean strainer. 5. Water temperature in excess of 195°F (91°C) – lower temperature setpoint. 6. Self-cleaning screen clogged – remove debris from screen. 7. Loose hose connection on pump suction strainer – tighten hose clamps or replace as necessary. 8. Spray jets misaligned – realign jets toward load surfaces. 9. Pump rotating in wrong direction – verify pump rotation as indicated by arrow.
15. Printing defect appears consistently in the same column.	Debris trapped on print head – dislodge debris by removing paper from printer, inserting a one-inch wide strip of bond type paper under the print head and moving the paper in both linear and circular motions.
16. Unit will not start.	1. Power OFF – turn power ON. 2. Hot water supply OFF – turn hot water supply ON. 3. Door switch failure – make sure door (s) are closed completely. 4. Faulty level sensing – clean probes in sump. 5. Blown fuse – call STERIS.*
17. Pump pressure too low.	1. Faulty level sensing – clean water level probes in sump. 2. Temperature in excess of 195°F (91°C) – lower set-point temperature. 3. Self-cleaning screen blocked – remove, clean, and reinstall properly. 4. Too much soap – rinse with cold water and decrease usage.
18. Pump pressure too high.	1. Self-cleaning screen blocked – remove, clean and reinstall properly. 2. Drain valve clogged – remove union exiting self-cleaning screen, clear obstruction and reconnect. 3. Spray jets clogged – poke debris into jets, remove plugs located at bottom of spray header, run spray manually, reinstall plugs.

Table 5-1. Troubleshooting Chart

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
19. Drive not moving.	Spray header jammed – verify inside cabinet for obstruction.
20. Unit not reaching guarantee.	1. Steam supply off – turn hot water supply on. 2. Set-point temperature too low – raise set-point temperature. 3. Plugged steam strainer – undo large nut on strainer, clean screen, and reinstall. 4. Stuck steam valve – cycle valve ON/OFF in Service Mode to free up. 5. Poor quality steam supply – test steam for pressure and moisture content to meet specifications. 6. Condensate line locked – free up and verify traps. 7. Guarantee deactivated – reactivate inside control panel.
21. Unit overheating.	1. Temperature in excess of 195 °F (91 °C) – lower set-point temperature. 2. Stuck steam valve – cycle valve ON/OFF in Service Mode to free up. 3. Leaking steam unions – tighten unions. 4. Leaking steam coil – remove and test.
22. Sump overfilling.	1. Faulty level sensing – clean water level probes in sump. 2. Filling valve malfunction – test for energizing, rebuild if necessary.
23. Sump not filling.	1. Hot water supply off – turn hot water supply on. 2. Faulty level sensing – clean probes in sump. 3. Valve malfunction – test for energizing, rebuild if necessary. 4. Too much soap – rinse with cold water and decrease usage.
24. Jets not spraying.	1. Temperature in excess of 195°F (91°C) – lower set-point temperature. 2. Self-cleaning screen blocked – remove, clean, and reinstall properly. 3. Spray jets clogged – poke debris into jets, remove plugs located at bottom of spray header, run spray manually, and reinstall plugs. 4. Jet ball valve failure – replace if necessary. 5. Plugs in spray header missing – reinstall plugs.

Table 5-1. Troubleshooting Chart

PROBLEM	POSSIBLE CAUSE AND/OR CORRECTION
25. Sump not draining properly.	1. Self-cleaning screen blocked – remove, clean, and reinstall properly. 2. Drain valve clogged – undo union exiting self-cleaning screen, clear obstruction, and reconnect. 3. Drain time set too short – raise time until there is approximately 15 seconds past pressure drop (sound change) in pump. 4. Plugged facility drain – rectify.
26. Unit not cleaning properly.	1. Temperature in excess of 195°F (91°C) – lower set-point temperature. 2. Self-cleaning screen blocked – remove, clean, and reinstall properly. 3. Drain valve clogged – undo union exiting self-cleaning screen, clear obstruction, and reconnect. 4. Spray jets clogged – poke debris into jets, remove plugs located at bottom of spray header, run spray manually, and reinstall plugs. 5. Spray header jammed – verify inside cabinet for obstruction. 6. Drain time set too short – raise time until there is approximately 15 seconds past pressure drop (sound change) in pump. 7. Too much soap – rinse with cold water and decrease usage. 8. Plugs in spray header missing – reinstall plugs.

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
1. Display shows: **LOAD DOOR** **OPEN WHEN PROCESSING** and printer prints: ALARM: HH:SS:MM LOAD DOOR OPEN WHEN PROCESSING	**Load-side door is detected open during cycle operation.** 1. Close and latch load-side door. 2. Press **ACK** touch pad to acknowledge alarm. 3. Load-side door open – close and latch door. 4. Press **RESUME CYCLE** touch pad to resume cycle operation. 5. Verify load-side door closed sensor operation – replace as necessary. 6. Exhaust dampered too much – adjust automatic damper. • **Alarm is triggered by:** Load door (LD) signal on Slot 1 in 4 is open during cycle operation.
2. Display shows: **UNLOAD DOOR** **OPEN WHEN PROCESSING** and printer prints: ALARM: HH:SS:MM UNLOAD DOOR OPEN WHEN PROCESSING	**Unload-side door is detected open during cycle operation.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Close and latch unload-side door. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. 4. Unload door latch incorrectly adjusted – adjust latch as necessary. 5. Verify unload-side door closed sensor operation – replace as necessary. 6. Exhaust dampered too much – adjust automatic damper. • **Alarm is triggered by:** Unload door (UD) signal on Slot 1 in 5 is open during cycle operation.

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
3. Display shows: **SUMP** **TOO LONG TO FILL** ... and printer prints: ALARM HH:MM:SS SUMP TOO LONG TO FILL	**Sump is not filled during allowed time.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Inspect if there is too much foam in chamber (improper detergent used or improper detergent concentration) – rinse chamber with cold water and decrease injection rate. 3. Verify hot water supply is open – open building supply valve if necessary. 4. Verify hot water supply pressure – check and adjust building hot water pressure. 5. Verify hot water fill valve operates properly – check and replace as necessary. 6. Not enough water pressure on unit – check and adjust or replace hot water manual valve, strainer, check valve and globe valve. 7. Verify sump water level sensor operates properly – check and replace as necessary. 8. Verify sump drain valve is fully closed. 9. Improper filling time – increase allowed filling time. 10. Defective alkaline wash tank dump valve (always closed) – repair or replace valve as necessary. 11. Alkaline wash tank manual valve open – check or replace valve as necessary. 12. Defective acid wash tank dump ball valve (always closed) – repair or replace valve as necessary. 13. Acid wash tank manual valve open – check or replace valve as necessary. • **Alarm is triggered by:** Sump low level signal, Slot 1 in 8 is open after allowed fill time has expired.

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
4. Display shows: **SUMP** **TOO LONG TO DRAIN** ... and printer prints: ALARM HH:MM:SS SUMP TOO LONG TO DRAIN	**Sump is not drained during allowed time.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Verify self-cleaning filter is not clogged – remove debris from filter if necessary. 3. Pump suction strainer clogged – clean stainer. 4. Sump high water level sensor malfunction – check sensor, clean or replace as necessary. 5. Defective recirculation pump – verify recirculation pump, fuses, contactor, repair or replace defective parts as necessary. 6. Defective sump drain valve (always closed) – repair or replace valves as necessary. 7. Compression fitting on pump RTD, located in suction pickup pipe is leaking air – check for leaks or correct installation as necessary. 8. Defective alkaline tank dump ball valve (always open) – repair or replace valve as necessary. 9. Defective acid tank dump ball valve (always open) – repair or replace valve as necessary. 10. Drain line plugged – flush out line. 11. Defective sump water fill valve (always open) – repair or replace valve as necessary. 12. Defective rack flush system water fill valve (always open)– check and replace as necessary. 13. Defective non-recirculating final rinse water fill valve (always open) – check and replace as necessary. 14. Improper draining time – increase allowed draining time. • **Alarm is triggered by:** Sump low level signal on Slot 1 in 8 is closed and draining time has reached 0.
5. Display shows: **SUMP RTD FAILURE** ... and printer prints: ALARM HH:MM:SS SUMP RTD FAILURE	**Faulty RTD sensor in chamber sump.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Sump RTD malfunction – check and calibrate or replace as necessary. 3. Poor electrical connection between sump RTD sensor and control – inspect connections and tighten if necessary. • **Alarm is triggered by:** Sump water temperature is lower than 35°F (9.5°C), Sump RTD signal on Slot 2 in 0

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
6. Display shows: **SUMP** **FAILED TO REACH TEMPERATURE** ... and printer prints: ALARM HH:MM:SS SUMP FAILED TO REACH TEMPERATURE	**Sump water temperature is not reached within allowed time.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Steam supply valve not fully open – open building and washer supply valves. 3. Not enough building steam pressure – check or adjust building steam pressure. 4. Not enough steam pressure on unit – check and adjust or replace steam manual ball valve, strainer and steam trap. 5. Defective sump steam valve – check and replace as necessary. 6. Sump RTD malfunction – check and calibrate or replace as necessary. 7. Defective sump water fill valve (always open) – check and replace as necessary. 8. Defective alkaline wash tank dump ball valve (always open) – check and replace as necessary. 9. Defective acid wash tank dump ball valve (always open) – check and replace as necessary. 10. Defective rack flush system water fill valve (always open) – check and replace as necessary. 11. Defective non-recirculating final rinse water fill valve (always open) – check and replace as necessary. 12. Temperature set too high – decrease programmed temperature setpoint. 13. Improper heating time – check heating time in service mode. 14. Poor electrical connection between sump RTD sensor and control – inspect connections and tighten if necessary. 15. Damper opened too wide – partially close damper. 16. Low dynamic steam pressure – provide steam at pressure specified on equipment drawing. • **Alarm is triggered by:** Heating time reaches 0 and sump water temperature is below setpoint.

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
7. Display shows: **ALK. TANK** **TOO LONG TO FILL** ... and printer prints: ALARM HH:MM:SS ALK. TANK TOO LONG TO FILL	**Hot water supply valve closed.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Building water supply valve not fully open – open building supply valves as necessary. 3. Not enough building water pressure – check or adjust building water pressure. 4. Not enough water pressure on unit – check or adjust or replace hot water manual valve, strainer and check valve. 5. Defective alkaline wash tank water fill valve – check and replace as necessary. 6. Alkaline wash tank high water level sensor malfunction – check operation of sensor, clean or replace as necessary. 7. Defective alkaline wash tank manual dump ball valve (always open) – repair or replace valve as necessary. 8. Alkaline wash tank manual dump valve open – check or replace valve as necessary. 9. Improper filling time – adjust filling time. • **Alarm is triggered by:** Alkaline tank high water level switch on Slot 1 in 9 is open and fill time reaches 0.
8. Display shows: **ALK. TANK** **TOO LONG TO DRAIN** ... and printer prints: ALARM HH:MM:SS ALK. TANK TOO LONG TO DRAIN	1. Press **ACK** touch pad to acknowledge alarm. 2. Hot water supply valve leaking. 3. Transfer valve closed – open valve. 4. Water level malfunctions – verify operation of water level. Clean as necessary. 5. Floor drain obstructed - purge drain line. 6. Press **RESUME CYCLE** touch pad to resume cycle operation. • **Alarm is triggered by:** Alkaline tank high water level switch on Slot 1 in 9 is closed and drain time has expired and sump water level has not been reached.

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
9. Display shows: **ALK. TANK** **RTD FAILURE** and printer prints: ALARM HH:MM:SS ALK. TANK RTD FAILURE	**Faulty RTD sensor in alkaline tank.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Alkaline wash tank RTD malfunction – check, calibrate or replace RTD as necessary. 3. Poor electrical connection between alkaline wash tank RTD sensor and control – inspect connections and tighten if necessary. • **Alarm is triggered by:** Alkaline tank water temperature is lower than 35ºF (9.5ºC) Signal on Slot 2 in 1.
10. Display shows: **ALK. TANK** **FAILED TO REACH TEMP** ... and printer prints: ALARM HH:MM:SS ACID TANK FAILED TO REACH TEMP	1. Steam supply valve not fully open – open building and washer supply valves. 2. Not enough building steam pressure – check and adjust building steam pressure. 3. Not enough steam pressure on unit – check and adjust or replace steam manual ball valve, strainer and steam trap. 4. Defective alkaline wash tank steam valve – check and replace as necessary. 5. Alkaline wash tank RTD malfunction – check and replace as necessary. 6. Defective alkaline wash tank fill valve (always open) – check and replace as necessary. 7. Defective alkaline wash tank return ball valve (always open) – check and replace as necessary. 8. Improper heating time – check heating time in Service Mode. 9. Temperature set too high – decrease programmed temperature setpoint. 10. Poor electrical connection between detergent tank RTD sensor and control – inspect connections and tighten if necessary. 11. Low dynamic steam pressure – provide steam at pressure specified on equipment drawing. 12. Fill water temperature too low – increase temperature of building water supply. • **Alarm is triggered by:** Heating time reaches 0 and alkaline tank temperature below setpoint.

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
11. Display shows: **ACID TANK** **TOO LONG TO FILL** ... and printer prints: ALARM HH:MM:SS ACID TANK TOO LONG TO FILL	1. Press **ACK** touch pad to acknowledge alarm. 2. Building water supply valve not fully open – check and open building supply valve as necessary. 3. Not enough building water pressure – check or adjust building water pressure. 4. Not enough water pressure on unit – check and adjust or replace hot water manual ball valve, strainer and check valve. 5. Defective acid wash tank water fill valve – check and replace as necessary. 6. Acid wash tank high water level sensor malfunction – check operation of sensor, clean or replace as necessary. 7. Defective acid wash tank dump ball valve (always open) – repair or replace valve as necessary. 8. Acid wash tank manual dump valve open – check or replace valve as necessary. 9. Improper filling time – check for filling time in Service Mode. • **Alarm is triggered by:** Acid tank level switch on Slot 1 in 10 is activated and fill time has reached 0.
12. Display shows: **ACID TANK** **TOO LONG TO DRAIN** ... and printer prints: ALARM HH:MM:SS ACID TANK TOO LONG TO DRAIN	1. Press **ACK** touch pad to acknowledge alarm. 2. Hot water supply valve leaking. 3. Transfer valve closed – open valve. 4. Water level malfunctions – verify operation of water level. Clean as necessary. 5. Floor drain obstructed – purge drain line. • **Alarm is triggered by:** Acid tank high water level switch on Slot 1 in 9 is closed and drain time has expired and sump water level has not been reached.

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
13. Display shows: **ACID TANK** **RTD FAILURE** ... and printer prints: ALARM HH:MM:SS ACID TANK RTD FAILURE	Faulty RTD sensor in detergent tank 1. Press **ACK** touch pad to acknowledge alarm. 2. Acid wash tank RTD malfunction – check, calibrate or replace as necessary. 3. Poor electrical connection between acid wash tank RTD sensor and control – inspect connections and tighten if necessary. • **Alarm is triggered by:** Acid tank temperature is lower than 35ºF (9.5ºC). Signal on Slot 2 in 2.
14. Display shows: **ACID TANK** **FAILED TO REACH TEMP** ... and printer prints: ALARM HH:MM:SS ACID TANK FAILED TO REACH TEMP	1. Press **ACK** touch pad to acknowledge alarm. 2. Building steam supply valve not fully open – check and open building and washer supply valves. 3. Not enough building steam pressure – check and adjust building steam pressure. 4. Not enough steam pressure on unit – check and adjust or replace steam manual ball valve, strainer and steam trap. 5. Defective acid wash tank steam valve – check and replace as necessary. 6. Acid wash tank RTD malfunction – check and calibrate or replace as necessary. 7. Defective acid wash tank water fill valve (always open) – check and replace as necessary. 8. Defective acid wash tank return ball valve (always open) – check and replace as necessary. 9. Improper heating time – check heating time in Service Mode. 10. Temperature set too high – decrease programmed temperature setpoint. 11. Poor electrical connection between detergent tank RTD sensor and control – inspect connections and tighten if necessary. 12. Fill water temperature too low – increase temperature of building water supply. • **Alarm is triggered by:** Heating time reaches 0 and acid tank temperature has not reached setpoint.

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
15. Display shows: **EMERGENCY STOP** **CABLE ACTIVATED** ... and printer prints: ALARM HH:MM:SS EMERGENCY STOP CABLE ACTIVATED	1. Press **ACK** touch pad to acknowledge alarm. 2. Safety cable pulled – open chamber door and remove obstruction from chamber. Press **RESUME CYCLE** touch pad to resume cycle operation or press **ABORT CYCLE** touch pad to abort cycle operation. 3. Safety cable too tight – adjust cable to allow a minimum of two inches (50 mm) free play. • **Alarm is triggered by:** Emergency cable signal on Slot 1 in 0.
16. Display shows: **EMERGENCY STOP** **PRESSED** ... and printer prints: ALARM HH:MM:SS EMERGENCY STOP PRESSED	1. Press **ACK** touch pad to acknowledge alarm. 2. Pull out **EMERGENCY STOP** buttons on both control sides. 3. Defective **EMERGENCY STOP** switch or open circuit (loose wiring or poor connection). 4. Press **RESUME CYCLE** touch pad to resume cycle operation or press **ABORT CYCLE** touch pad to abort cycle operation. • **Alarm is triggered by:** Emergency Stop signal on Slot 1 in 1 (unload) and Slot 1 in 2 (load).

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
17. Display shows: **COOLDOWN TANK** **TOO LONG TO FILL** ... and printer prints: ALARM HH:MM:SS COOLDOWN TANK TOO LONG TOFILL	1. Press **ACK** touch pad to acknowledge alarm. 2. Self-cleaning screen clogged – remove debris from screen. 3. Pump suction strainer clogged – clean strainer. 4. Cooldown tank low water level float ball malfunction – check operation of float. Clean or replace as necessary. 5. Defective cooldown tank dump ball valve (always open) – repair or replace valve as necessary. 6. Defective sump drain ball valve(s) (always closed) – repair or replace valve(s) as necessary. 7. Defective recirculation pump(s) – verify recirculation pump(s), fuses, contactor. Repair or replace defective parts as necessary. 8. Defective alkaline tank return ball valve (always open) – repair or replace valve as necessary. 9. Defective acid tank return ball valve (always open) – repair or replace valve as necessary. 10. Defective bottle wash ball valve (always open) – repair or replace valve as necessary. 11. Defective jet ball valve (always open) – repair or replace valve as necessary. 12. Defective central header ball valve (always open) – repair or replace valve as necessary. 13. RTD compression fitting on pump, located in suction pick-up pipe is leaking air – check for leaks or correct installation as necessary. • **Alarm is triggered by:** Cooldown tank high level switch signal on slot 1 in 11 and fill time has reached "0".

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
18. Display shows: **COOLDOWN TANK TOO LONG TO COOL** ... and printer prints: ALARM HH:MM:SS COOLDOWN TANK TOO LONG TO COOL	1. Press **ACK** touch pad to acknowledge alarm. 2. Cold water supply valve not fully open – open building and washer supply valves. 3. Building water supply valve not fully open – check and open building supply valve as necessary. 4. Improper cooling time – check for cooling time in Service mode. 5. Not enough building water pressure – check water pressure is as specified on equipment drawing. Adjust building water pressure. 6. Not enough water pressure on unit – check and adjust or replace cold water manual ball valve, strainer and check valve. 7. Defective cooldown tank water fill valve – check and replace as necessary. 8. Cooldown tank RTD malfunction – check and calibrate or replace as necessary. 9. Defective sump drain ball valve(s) (always open) – repair or replace valve(s) as necessary. • **Alarm is triggered by:** Cooling time reaches 0 and cooldown tank temperature is above setpoint.
19. Display shows: **COOLDOWN TANK TOO LONG TO DRAIN** ... and printer prints: ALARM HH:MM:SS COOLDOWN TANK TOO LONG TO DRAIN	1. Press **ACK** touch pad to acknowledge alarm. 2. Improper draining time – check draining time in Service mode. 3. Cooldown tank low water level float ball malfunction – check operation of float. Clean or replace as necessary. 4. Defective cooldown tank dump ball valve (always closed) – repair or replace valve as necessary. 5. Cooldown tank check valve is plugged – check or replace as necessary. 6. Drain line clogged – Flush out line. 7. Defective cooldown tank cold water fill valve (always open) – check and replace as necessary. 8. Defective sump drain ball valve(s) (always open) – repair or replace valve(s) as necessary. • **Alarm is triggered by:** Cooldown tank low level switch signal on slot 1 in 12 and there is less than 20 seconds remaining.

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
20. Display shows: **COOLDOWN TANK FULL** ... and printer prints: ALARM HH:MM:SS COOLDOWN TANK FULL	1. Press **ACK** touch pad to acknowledge alarm. 2. Improper temperature setpoint – check for temperature setpoint in Service mode. 3. Cooldown tank high water level malfunction – check operation of float. Clean or replace as necessary. 4. Defective cooldown tank cold water fill valve – check and replace as necessary. 5. Defective sump drain ball valve(s) (always open) – repair or replace valve(s) as necessary. • **Alarm is triggered by:** During sump draining, cooldown tank high level switch Slot 1 in 11 and cooldown tank low level switch Slot 1 in 12. During tank cooldown phase, cooldown tank high level switch Slot 1 in 11 and cooldown tank low level switch Slot 1 in 12.
21. Display shows: **COOLDOWN TANK FLOAT FAILURE** ... and printer prints: ALARM HH:MM:SS COOLDOWN TANK FLOAT FAILURE	**Cooldown tank high or low water level ball float malfunction** 1. Press **ACK** touch pad to acknowledge alarm. 2. Verify operation of float. Clean as necessary. 3. Press **RESUME CYCLE** touch pad to resume cycle operation. • **Alarm is triggered by:** During cooling phase and sump draining phase cooldown tank high level switch A Slot 1 in 11 and cooldown tank low level switch Slot 1 in 12.
22. Display shows: **COOLDOWN RTD DEFECTIVE** ... and printer prints: ALARM HH:MM:SS COOLDOWN RTD DEFECTIVE	1. Press **ACK** touch pad to acknowledge alarm. 2. Cooldown tank RTD malfunction – check and calibrate or replace as necessary. 3. Poor electrical connection between cooldown tank RTD sensor and control – inspect connections and tighten if necessary. • **Alarm is triggered by:** Cooldown tank is lower than 35ºF (9.5ºC) signal on Slot 2 in 3.

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
23. Display shows: **pH TOO HIGH** **CHECK INJ. SYSTEM** ... and printer prints: ALARM HH:MM:SS pH TOO HIGH CHECK INJ. SYSTEM	1. Press **ACK** touch pad to acknowledge alarm. 2. Alkaline neutralizer container empty – check and replace container. 3. Improper pH limits – check for pH low and high limits in Service mode. 4. Improper number of pH tries – check number of pH tries in Service mode and increase as necessary. 5. Improper neutralization injection time – check for injection, waiting and mixing times in Service mode. Adjust as necessary. 6. Alkaline neutralizer pump defective – repair or replace as necessary. 7. Wrong chemical used – check and replace as necessary. 8. pH probe malfunction – check for calibration or replace as necessary. • **Neutralization in Cooldown tank:** 9. Mixing motor malfunction – check or replace as necessary. • **Neutralization in sump:** 10. Self-cleaning screen clogged – remove debris from screen. 11. Pump suction strainer clogged – clean strainer. 12. Defective recirculation pump(s) – check recirculation pump(s), fuses, contactor. Repair or replace defective parts as necessary. 13. Defective alkaline tank return ball valve (always open) – repair or replace valve as necessary. 14. Defective acid tank return ball valve (always open) – repair or replace valve as necessary. 15. Defective jet ball valve(s) (always closed) – repair or replace valve as necessary. 16. Defective sump drain ball valve(s) (always open) – repair or replace valve as necessary. 17. RTD compression fitting on pump, located in suction pickup pipe is leaking air – check for leaks or correct installation as necessary. • **Alarm is triggered by:** pH too high.

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
24. Display shows: **pH TOO LOW** **CHECK INJ. SYSTEM** ... and printer prints: ALARM HH:MM:SS pH TOO LOW CHECK INJ. SYSTEM	1. Press **ACK** touch pad to acknowledge alarm. 2. Acid neutralizer container empty – check and replace container. 3. Improper neutralization injection time – check for injection, waiting and mixing times in Service mode. Adjust as necessary. 4. Improper number of pH tries – check number of pH tries in Service mode and increase as necessary. 5. Improper pH limits – check for pH low and high limits in Service mode. Adjust as necessary. 6. Acid neutralizer pump defective – repair or replace as necessary. 7. Wrong chemical used – check and replace as necessary. 8. pH probe malfunction – check for calibration or replace as necessary. • **Neutralization in Cooldown tank:** 9. Mixing motor malfunction – check or replace as necessary. • **Neutralization in sump:** 10. Self-cleaning screen clogged – remove debris from screen. 11. Pump suction strainer clogged – clean strainer. 12. Defective recirculation pump(s) – verify recirculation pump(s), fuses, contactor. Repair or replace defective parts as necessary. 13. Defective alkaline tank return ball valve (always open) – repair or replace valve as necessary. 14. Defective acid tank return ball valve (always open) – repair or replace valve as necessary. 15. Defective jet ball valve(s) (always closed) – repair or replace valve as necessary. 16. Defective sump drain ball valve(s) (always open) – repair or replace valve as necessary. 17. RTD compression fitting on pump, located in suction pickup pipe is leaking air – check for leaks or correct installation as necessary. • **Alarm is triggered by:** pH too low.

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
25. Display shows: **pH SIGNAL** **OPEN CIRCUIT** ... and printer prints: ALARM HH:MM:SS pH SIGNAL OPEN CIRCUIT	1. Press **ACK** touch pad to acknowledge alarm. 2. Wiring malfunction – check connections between pH controller and PLC controller. • **Alarm is triggered by:** Signal not present at analog input module Slot 3 1 in 0 + DC V/I in 0 -.
26. Display shows: **CONDUCT. TOO LOW** **CHECK INJECT. SYSTEM** ... and printer prints: ALARM HH:MM:SS CONDUCT. TOO LOW CHECK INJECT. SYSTEM	1. Press **ACK** touch pad to acknowledge alarm. 2. Alkaline detergent container empty – check and replace detergent container as necessary. 3. Acid detergent container empty – check and replace detergent container as necessary. 4. Improper detergent monitoring time – check for detergent monitoring time in Service mode. 5. Alkaline detergent pump malfunction – check and replace detergent pump as necessary. 6. Acid detergent pump malfunction – check and replace detergent pump as necessary. 7. Conductivity probe malfunction – check for calibration or replace as necessary. 8. Defective sump water fill valve (always open) – check and replace as necessary. 9. Defective alkaline wash tank dump ball valve (always open) – check and replace as necessary. 10. Defective acid wash tank dump ball valve (always open) – check and replace as necessary. 11. Defective rack flush system water fill valve (always open) – check and replace as necessary. 12. Defective non-recirculating final rinse water fill valve (always open) – check and replace as necessary. • **Alarm is triggered by:** Conductivity relay signal on analog inputs module Slot 3, 1 in 1+ V/I in 1- and conductivity phase timer is at "0".

Table 5-2. Fault Chart

PROBLEM	POSSIBLE CAUSE AND/CORRECTION
27. Display shows: **CARRIAGE SYSTEM FAILURE** ... and printer prints: ALARM HH:MM:SS CARRIAGE SYSTEM FAILURE	1. Press **ACK** touch pad to acknowledge alarm. 2. Drive clutch loose – tighten clutch to specification. 3. Spray headers hitting sealing strips covering vertical panel joints – adjust headers as necessary. 4. Drive cable is loose or broken – tighten or replace cable as necessary. 5. Drive motor not running – check or replace drive motor, fuses or contactor as necessary. 6. Carriage switches malfunction – check or replace switches as necessary. • **Alarm is triggered by:** Drive forward switch Slot 1 in 6 and drive reverse switch Slot 1 in 7.
28. Display shows: **PLC CONTROLLER BATTERY LOW** ... and printer prints: ALARM HH:MM:SS PLC CONTROLLER BATTERY LOW	**PLC Battery needs to be replaced.** 1. Press **ACK** touch pad to acknowledge alarm. 2. Replace PLC battery. 3. Replace CPU module. • **Alarm is triggered by:** CPU module battery low detected.
29. Display shows: **UNKNOWN FAILURE DETECTED** ... and printer prints: ALARM HH:MM:SS UNKNOWN FAILURE DETECTED	A PLC fault has occurred in the control. 1. Press **ACK** touch pad to acknowledge alarm. 2. Turn control power switch OFF then ON. If condition clears from the control, unit can be used. • **Alarm is triggered by:** PLC fault detected in control.
30. Display shows: **WASHER LOCKED** ... and printer prints: ALARM HH:MM:SS WASHER LOCKED	1. Turn key selector to INIT position and then return key selector to UNLOCK position. 2. Press **ACK** touch pad to acknowledge alarm. • **Alarm is triggered by:** Washer key switch is in **LOCK** position.

Section 6: Field Test Procedures

IMPORTANT: *A listing of the Safety Precautions to be observed when operating and servicing these washers can be found in SECTION 1 of this manual. Do not operate or service the equipment until you have become familiar with this information.*

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: Repairs and adjustments to this equipment must be made only by STERIS or STERIS-trained service personnel. Nonroutine maintenance performed by unqualified personnel or installation of unauthorized parts could cause personal injury, result in improper equipment performance, void the warranty or result in costly damage. Contact STERIS regarding service options.

WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD: Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

6.1 GENERAL

Each unit must be tested and inspected according to this procedure whenever a part is adjusted, repaired or replaced. Items which do not comply to test procedures must be corrected and retested.

Keep record of all readings, measurements, discrepancies, corrections, tests and reinspections. Each test must meet the standards of material and performance set forth in this procedure. Refer to *SECTION 7, COMPONENT REPAIR AND REPLACEMENT,* should mechanical problems arise or adjustment be required.

Read the complete test procedure carefully to know steps to be accomplished and test equipment required before starting.

6.2 TEST INSTRUMENTATION REQUIRED

- Stopwatch — to verify cycle phase timing and injection times.
- Calibrated pressure gauge 1/4" NPT 0-160 psi (0-1100 kPa).
- Calibrated pressure gauge 1/4" NPT 0-20 psi (0-138 kPa).
- Digital potentiometer with 2 thermocouple extensions.
- Multimeter (voltage, amps, ohms).

1. Place 0-160 psi pressure gauge on pressure piping above pressure transmitter.
2. Place 0-20 psi pressure gauge on suction piping upstream from self cleaning screen.
3. Place one thermocouple on a load in the middle of wash chamber and the other one at the inlet of the exhaust duct inside wash chamber (if drying system option is present).

6.3 PRELIMINARY CHECKS

1. Verify proper hookup of electric and water supplies.
2. Inspect all piping clamps and tighten if necessary.
3. Verify all electrical devices (valves, sensors, switches, control) are connected.
4. Clean sump screen inside wash chamber and self-cleaning screen on service side.

6.4 OPERATIONAL AND SAFETY TESTS

WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: To open doors from inside wash chamber, pull EMERGENCY STOP cables. Washer operation will automatically stop. Then, push firmly on door panel using shoulder and upper arm, applying upper body force.

Open all utilities (air, hot water, cold water, steam), put electrical disconnect switch to **ON** position.

1. Control should now be in Automatic Mode and display Main Cycle Menu.
2. Open door(s) (if not already open).
3. Inside chamber, pull left EMERGENCY STOP cable. Control and all outputs should be de-energized.
4. Replace left EMERGENCY STOP cable. Control should be re-energized and display should show Main Cycle Menu.

5. Repeat preceding steps to test right EMERGENCY STOP cable.

6.5 INPUTS/OUTPUTS TEST

1. Enter in Service Mode (refer to *SECTION 2, SERVICE MODE PROCEDURES*).
2. Verify all inputs and outputs for proper operation (refer to *SECTION 2, SERVICE MODE PROCEDURES*).
3. While in outputs menu in Service Mode, verify for smooth operation of doors and oscillating jet system.

6.6 START-UP PROCEDURES

NOTE: Start-up procedures are to be performed after utility connections and installation checklist are completed and prior to unit operation by customer.

1. Adjust spray jets along top and sides of chamber as follows:
   a. Using a flat surface (e.g., credit card), determine where each spray jet is directed.
   b. Roughly position the four carriage spray jets (top of chamber) straight down by rotating the main pipe.
   c. Roughly position spray jets on both U-shaped headers (both sides of chamber) to direct water straight across from each header.

      NOTE: Jets must be positioned so that spray is 6' away from the door when carriage is at end of the chamber.

   d. Individually adjust the bottom header spray jets to direct water 45° inward.
   e. Individually adjust the corner header spray jets to direct water 45° inward.
   f. Individually adjust the remaining header spray jets to direct water straight out.
   g. Securely tighten all spray jets. Do not leave spray jets finger tight.
2. Check rotation of recirculation pump(s). Bump motor starter and watch pump shaft to see if it is rotating in correct direction. If pump shaft is rotating in wrong direction, disconnect main power, reverse any two high voltage wires on motor starter and re-check pump rotation.
3. If applicable, check rotation of optional exhaust fan. Bump exhaust fan motor starter. From top of cabinet, light a match and verify smoke is being drawn into exhaust fan. If exhaust fan is rotating in wrong direction, disconnect main power, reverse any two high voltage wires on motor starter and re-check fan rotation.
4. Adjust drive system clutch. Remove safety cover from top of drive motor capstan. Loosen set screws on the 3/4-inch adjusting nut located in center of capstan. Torque adjusting nut to 35 ft/lbs. When properly adjusted, clutch prevents damage to equipment and load if carriage assembly becomes obstructed.

⚠ WARNING – PERSONAL INJURY AND/OR EQUIPMENT DAMAGE HAZARD: When checking rotation of drive motor, use extreme caution. If rotation is incorrect, carriage will run directly into the door header.

5. Verify rotation of drive motor and direction of carriage assembly as follows (see Figure 6-1):
   a. In Mode Selection screen press **MANUAL** touch pad to access Manual Control mode.
   b. In Manual Mode Screen press **DRIVE** touch pad. DRIVE touch pad turns ON.

      NOTE: Press or release DRIVE touch pad to activate or deactivate drive motor while visually checking drive motor. It may be necessary to immediately stop the drive function.

   c. As the drive motor is rotating, watch the actuator block located on the cable. Once the actuator block strikes the limit switch (rabbit ears), drive motor should stop and reverse rotation, and carriage assembly should reverse direction.
   d. If the actuator block pulls the limit switch (rabbit ears) past 90°, immediately press **DRIVE** touch pad. Disconnect main power and switch any two incoming high voltage wires on the motor starter. Re-check drive motor rotation.

      NOTE: DRIVE function is the only manual function that can be operated while the chamber door is open.

6. Turn on building water supplies and check for piping leaks.
7. Access manual control mode and individually test each manual function.
   a. Press **FILL SUMP** touch pad. Looking through the door window, check for incoming water flow. Once fill function automatically stops, open chamber door and check that float switch is engaged (sump is full).
   b. Press **PUMP/DRIVE** touch pad. During pump/drive function, check for proper operation of recirculation pump and carriage drive system; water should spray from the carriage

and header spray jets as the carriage assembly moves back and forth.

c. Press **DRAIN** touch pad. Once Drain function automatically stops, open chamber door. No water should remain in chamber sump.

d. Exit manual control mode by pressing **X**.

8. Select any pre-programmed cycle and press **START**. Run one complete cycle and check mechanical operation of washer.

9. Run several cycles, testing all available options. Make sure washer functions properly and is leak-free.

10. On distribution terminal, verify voltage and amperage of water pump are within specifications:

    - VOLTAGE AMPERAGE MAX.

      208 V (187 to 229 V) 5.8 A

      480 V (432 to 528 V) 2.5 A

      380-400-415 V (342 to 457 V) 3.0 A

11. Start a cycle in Automatic Mode and record pressure of each supply at appropriate times during cycle testing.

    - Dynamic pressures should be:

      Hot water: 15 to 50 psig (103 to 345 kPa);

      Cold water: 30 to 50 psig (207 to 345 kPa);

      Steam: 30 to 80 psig (207 to 550 kPa).

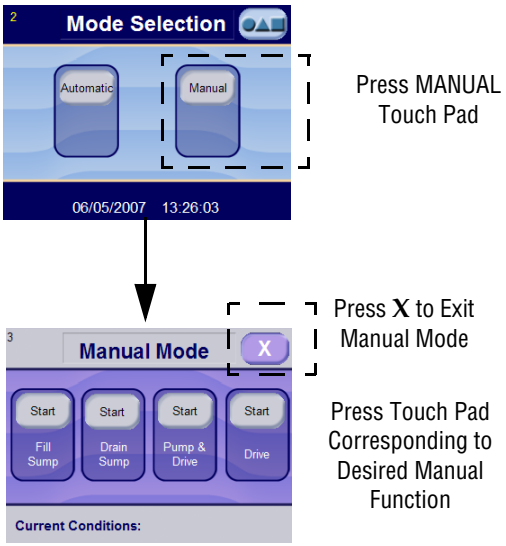


Figure 6-1. Manual Functions

Section 7: Component Repair and Replacement

IMPORTANT: A listing of the Safety Precautions to be observed when operating and servicing this Cage and Rack Washer can be found in Section 1 *of this manual. Do not operate or service the equipment until you have become familiar with this information.*

7.1 GENERAL DESCRIPTION

This section includes procedures for disassembly, repair and replacement of selected washer components.

WARNING – PERSONAL ANJURY AND/OR EQUIPMENT DAMAGE HAZARD: Only STERIS or STERIS-trained service personnel should make repairs and adjustments to this equipment. Maintenance done by inexperienced, unqualified personnel or installation of unathorized parts could cause personal injury, invalidate warranty, or result in costly damage. Contact STERIS regarding service options.

WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD: Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

WARNING BURN – HAZARD: Allow unit to cool down before performing any service on mechanical components and on piping. Components and piping become very hot during operation.

7.2 DOOR(S)

7.2.1 How to Replace Door Gasket

WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD: Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

1. Lock unit electrical disconnect switch in OFF position and close unit supply valves.
2. Open door. Pull out old gasket from frame, starting by the center on top of door frame.
3. Remove all silicone traces.
4. Replace gasket with a new one.
5. Close door and position POWER switch to ON. Run a cycle to verify gasket does not leak.

7.2.2 How to Replace and Adjust Microswitch

WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD: Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

1. Lock unit electrical disconnect switch in OFF position and close unit supply valves.
2. Remove screws holding door microswitch box cover in place.
3. Remove cover from microswitch mounting bracket(s).

   IMPORTANT: Make note of electrical connections for reassembly.
4. Disconnect all electrical wiring from faulty microswitch.
5. Remove two mounting bolts and nuts retaining microswitch to mounting bracket.
6. Remove microswitch and replace with a new one.
7. Using bolts and nuts previously removed, securely fasten microswitch to mounting bracket. Ensure roller on microswitch lever faces toward washer, so that it is accessible through cutout in box cover.
8. Reconnect wiring to switch.
9. Replace microswitch box cover. Verify roller on switch lever comes through cutout in box cover.
10. Position unit electrical disconnect switch to ON and open unit supply valves.
11. Verify operation of door microswitch by opening door during a cycle. If washer operation is not stopped when door is opened, press STOP and adjust door microswitch.

- Adjustment

1. Lock electrical disconnect switch to OFF, position power switch to OFF and close unit supply valves.
2. Remove screws holding door microswitch box cover in place.
3. Remove cover from microswitch mounting bracket(s).

4. Adjust microswitch by slightly bending switch lever.
5. Replace microswitch box cover. Verify roller on switch lever comes through cutout in box cover.
6. Unlock building electrical supply disconnect switch and set to ON. Open unit supply valves and turn power switch to ON.
7. Run a cycle and open door to verify Microswitch operation.

7.2.3 Window and Window Gasket Replacement

See Figure 7-1.

1. Position POWER switch to OFF.
2. Remove window and gasket as follows:
   a. Open chamber door.
   b. Locate end of seal wedge in window gasket on inside of door.
   c. Pry end of wedge out of gasket groove. Pull on loose end of seal wedge to remove wedge from gasket groove.
   d. Pull inside lip of gasket away from window glass and carefully remove glass.
   e. Remove and discard used gasket.
3. Install new gasket around window opening in door.
4. Starting in lower corner, place new window glass into gasket groove. Work glass into place along lower edge first, then, up both sides, and then along top edge of gasket. Make sure window is securely fitted into gasket groove.
5. Using window gasket installation tool (P117950-035), pry to open groove in gasket and place one end of wedge into groove.
6. Slowly pull installation tool along gasket while pushing wedge into groove behind tool. Continue around entire window.
7. Ensure gasket, window and wedge are securely in place. Apply on inside of door only, a thin layer of silicone sealant over joint between gasket and door.
8. Close door and position POWER switch to ON. Run a cycle to verify gasket does not leak.

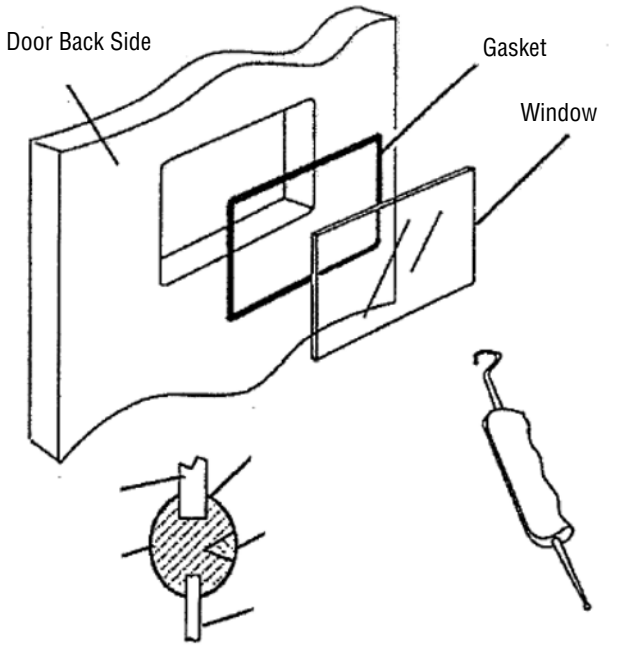


Figure 7-1. Door Window and Gasket Replacement

7.3 HOW TO REPLACE INTERIOR LIGHT LAMP

1. Lock unit electrical disconnect switch in OFF position.
2. Unscrew old lamp from socket and replace with a new one.
3. If you need to replace socket assembly, proceed as follows:
   a. On top of unit unplug cable connector (IL).
   b. On top of light assembly, remove two screws fastening socket to holder.
   c. Replace socket with a new one.
   d. Fasten socket with two screws previously removed.
   e. Plug in cable connector (IL).
4. Unlock unit electrical disconnect switch and put in ON position.

7.4 CHEMICAL INJECTION PUMP

⚠ WARNING – CHEMICAL BURN/EYE INJURY HAZARD: Detergents are caustic and can cause adverse effects to exposed tissues. Do not get in eyes, on skin or attempt to swallow. Read and follow the precautions and instructions on the detergent label and in the Material Safety Data Sheet (MSDS) prior to handling the detergent, refilling the detergent container or servicing the detergent injection pump. Wear appropriate Personal Protective Equipment (PPE) whenever handling the detergent or servicing the detergent injection pump and lines.

⚠ WARNING – SLIPPING HAZARD: To prevent slips, keep floor dry. Promptly cleanup any spills or drippage. If spills or drippage are detergents or other chemicals, follow Safety Precautions and handling procedures set forth on detergent or chemical label and/or Material Safety Data Sheet (MSDS).

Chemical injection pumps are located on service side, on solution tank.

7.4.1 Squeeze Tube Replacement

See Figure 7-2.

⚠ WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD: Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

⚠ WARNING – BURN HAZARD: Allow unit to cool down before performing any service on pump. Piping and valves become very hot during unit operation.

1. Lock building electrical supply disconnect switch in OFF position and close unit supply valves.
2. Lift end of pick-up tube out of detergent container.
3. Remove clamps and disconnect tube end from the feed line.

   NOTE: Let squeeze tube content drain off in pan under pumps.
4. Remove screws on pump cover and lift off pump cover.
5. Grasp one end of squeeze tube and pull tube out of pump. Discard tube.
6. Clean all pump surfaces.
7. Lubricate new squeeze tube (P177950-583). Liberally apply lubricant (P117950-599) over tube surface to within 2" [51 mm] of each end.
8. Insert one end of squeeze tube into pump. Feed tube through pump by manually rotating roller block.
9. Spread lubricant over rollers in roller block.
10. Replace pump cover and fasten with screws previously removed.
11. Connect supply and injection hoses to ends of squeeze tube and attach clamps.
12. Re-energize washer utilities.

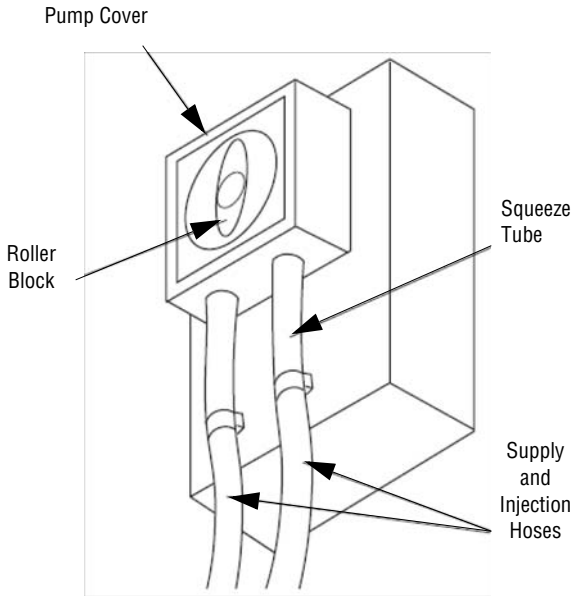


Figure 7-2. Chemical Injection Pump

7.4.2 Chemical Injection Pump Motor Replacement

See Figure 7-3.

⚠ WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD: Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

⚠ WARNING – BURN HAZARD: Allow unit to cool down before performing any service on pump. Piping and valves become very hot during unit operation.

⚠ WARNING – CHEMICAL BURN/EYE INJURY HAZARD: Wear gloves and eye protection

when removing clamps and replacing squeeze tube. Residual detergent might remain in used squeeze tube. If detergent contacts skin or eyes, immediately flush with running water for at least 10 minutes. If contact was with the eyes, seek medical attention.

1. Lock building electrical supply disconnect switch in OFF position and close unit supply valves.
2. Remove two screws attaching pump cover to pump head. Lift cover away from head.
3. Pulling on one end of squeeze tube, pull tube out of pump head.
4. Using an Allen hex key, remove setscrew. Lift roller block out of head.
5. Remove two screws holding head in place. Pull head away from pump motor.

   NOTE: Make note of electrical connections for reassembly.
6. Unplug pump and remove two screws attaching base of pump assembly to bracket. Remove pump assembly from detergent compartment.
7. Untighten nut holding ground to motor.
8. Disconnect all electrical connections from the motor.
9. Remove two screws fastening motor to pump assembly base.

⚠ CAUTION – POSSIBLE EQUIPMENT DAMAGE: Ensure a cooling fan is attached to rear motor shaft. Check that the fan blades are positioned to send airflow to motor. Motor will overheat without a cooling fan.

10. Remove propeller and install on new motor.
11. Attach new motor to pump assembly with screws previously removed.
12. Reconnect all electrical connections.
13. Tighten nut holding ground to motor.
14. Plug pump and secure with two screws previously removed.
15. Reinstall head and secure with two screws previously removed.

⚠ CAUTION – POSSIBLE EQUIPMENT DAMAGE: Carefully tighten setscrew. Metal setscrew can easily strip plastic threads in roller block assembly.

16. Reinstall roller block and secure with set screw previously removed.
17. Reinstall squeeze tube.
18. Reinstall pump cover to pump head kit with two screws previously removed.
19. Initiate a cycle and check pump motor operation.

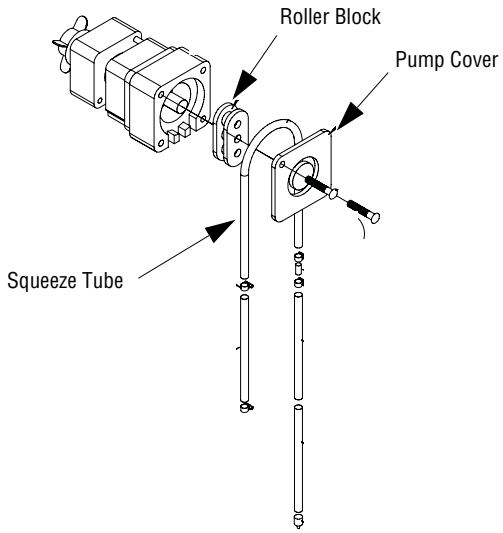


Figure 7-3. Replace Pump Motor

7.5 CARRIAGE DRIVE

7.5.1 Adjusting Carriage Drive Clutch

1. Set POWER-OFF/STANDBY switch to OFF/STANDBY. Lock disconnect switch in OFF position and close building supply valves.
2. Remove safety cover from top of drive motor capstan.
3. Loosen setscrews on 3/4" adjusting nut located in center of capstan (see Figure 7-4).
4. Tighten adjusting nut in 1/16 turn increments until carriage moves smoothly back-and-forth.
5. Tighten setscrews and replace safety cover.
6. Re-energize washer utilities.

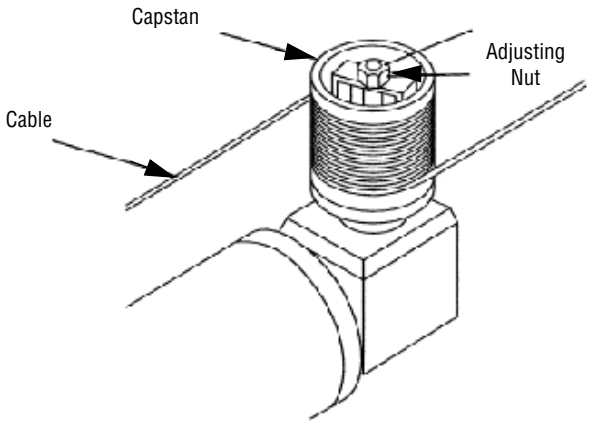


Figure 7-4. Drive Clutch

7.5.2 Adjusting Carriage Drive Cable

Evenly tighten eye bolts, located in center of carriage to remove slack from cable. Ensure adjusting eye bolts evenly to maintain a centered carriage.

NOTE: There should be a minimum of one or two inches (25 to 50 mm) free play in cable.

7.5.3 Replacing Carriage Drive Cable

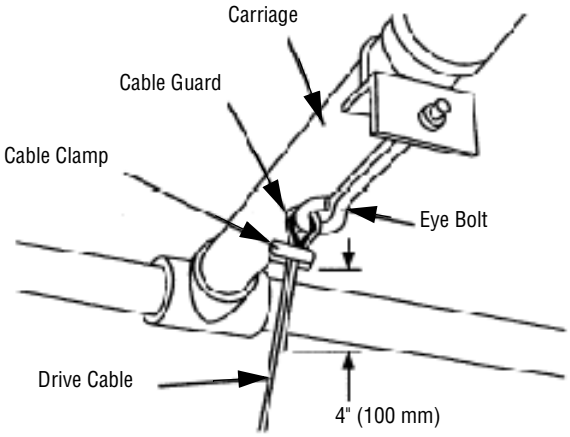


Figure 7-5. Carriage Eye Bolt

- Remove old drive cable as follows:

1. Lock disconnect switch in OFF position and close building supply valves.
2. Loosen eye bolts, located in center of carriage, until only one full nut of threads remains on each.
3. Disconnect drive cable from carriage by removing cable clamps and pulling ends of cable out of eye bolts (see Figure 7-5).
4. Pull cable ends out of inner roller brackets (see Figure 7-6).
5. From service side, pull cable ends through brass caps and outer roller brackets.
6. Unwind cable from capstan and pull entire length of cable out of holes in capstan.
7. Remove limit switch actuator block clamped to cable and discard cable.

- Prepare for new cable installation as follows:

1. Position carriage to approximate center of wash chamber.
2. Loosen drive clutch by loosening adjusting nut located in center of capstan (refer to Section 7.5.1, Adjusting Carriage Drive Clutch).
3. Turn capstan until holes are facing cabinet. Retighten drive clutch.
4. Remove brass caps, located in wash chamber, from service side cabinet wall.

- Install new cable as follows:

1. With cable ends tightly wrapped with tape, thread cable through holes in capstan. Pull approximately half of cable through capstan.
2. Facing capstan, take right half of cable and make three revolutions around capstan (downward on capstan) by passing under cable protruding to left (see Figure 7-7).
3. Working with right half of cable, feed cable through limit switches and around outer roller bracket (see Figure 7-6). Insert cable through cabinet opening and install brass cap. Feed cable around inner roller bracket and pull cable six inches past first carriage eye bolt.
4. Thread cable through eye bolt and clamp cables as close to eye bolt as possible allowing approximately four inches of cable to extend past clamp.
5. Insert cable guard between cable and eye bolt to prevent wear on cable.
6. With carriage centered, work cable back through drive system until cable is semi-tight and lays in grooves of capstan.
7. Working with cable protruding to left of capstan, make two revolutions around capstan spiraling upward. Feed cable around outer roller bracket and through cabinet opening. Install brass cap and feed cable around inner roller bracket. Pull cable tight.
8. Thread cable through eye bolt and clamp cable as close to eye bolt as possible. Cut off excess cable leaving approximately four inches of cable extending past clamp. Tightly wrap end of cable with tape to prevent unraveling.
9. Insert cable guard between cable and eye bolt.
10. With carriage centered in wash chamber, attach limit switch actuator block to drive cable, half way between limit switches.
11. Evenly tighten eye bolts to remove slack from cable.

NOTE: Cable should remain slack enough to allow limit switch actuator block one inch movement up or down from center.

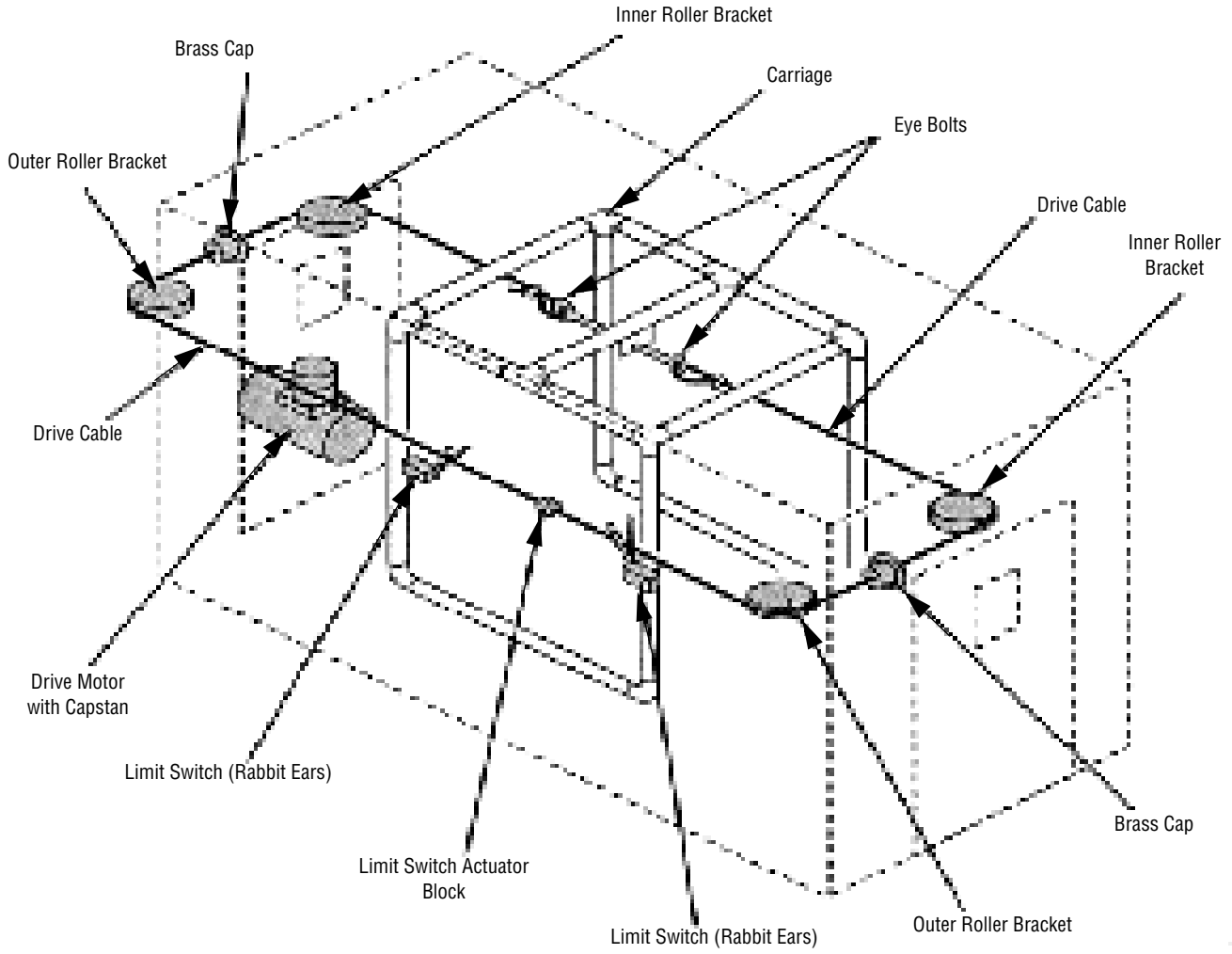


Figure 7-6. Carriage Drive System

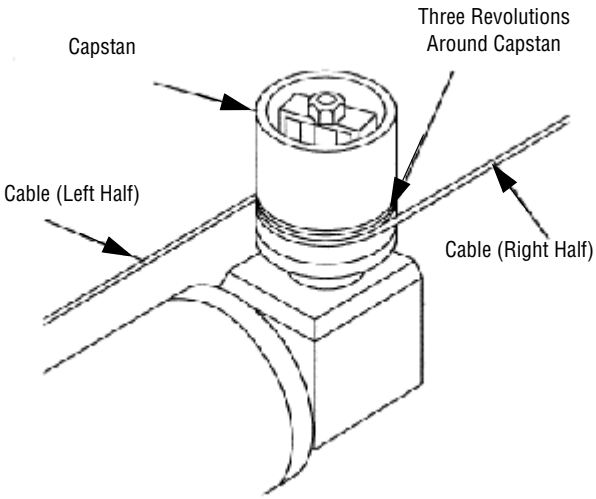


Figure 7-7. Wrap Cable Around Capstan

- Test drive cable installation as follows:

1. Loosen drive clutch (refer to Section 7.5.1, Adjusting Carriage Drive Clutch). Physically push carriage to approximately 6" (152 mm) from each end of wash chamber. Ensure cable is riding properly on all roller brackets and capstan, limit switch actuator block is centered properly, and that there are no obstructions.

   NOTE: Cable should wind on capstan smoothly without binding or crossing over itself.

2. Correctly adjust drive clutch (refer to Section 7.5.1, Adjusting Carriage Drive Clutch). Re-energize washer utilities and manually operate DRIVE function through Manual Control mode. While carriage drive system is operating, verify drive motor stops and reverses rotation and carriage reverses direction once actuator block strikes limit switch,
3. Reverify cable tension. Do not overtighten as it will reduce life of cable and roller brackets.

7.6 PUMP MOTOR

Pump motor must be lubricated once a year. When necessary, grease can be completely renewed by forcing out old grease with new grease.

1. If possible place a pan under motor to catch old grease.

   NOTE: Motor should be lubricated while warm.

2. Thoroughly wipe off housing around fill and drain plugs.
3. Remove fill and drain plugs. Clear drain hole of any hardened grease which may have accumulated.

   NOTE: Depending on model and year of pump, motor may be equipped with additional fill and drain plugs.

4. Using a low pressure grease gun, add recommended grease through fill hole until it starts to come out of drain hole.
5. Run motor for 10 to 20 minutes to expel any excess grease.
6. Thoroughly clean fill and drain plugs before replacing them.

7.7 VERIFY SAFETY CABLE TENSION

1. Select and start any pre-programmed cycle.
2. During cycle operation, manually activate microswitch, located on main control panel, by pushing lever/collar against spring actuator (see Figure 7-8).
3. Verify all washer operations immediately stop and do not restart until lever is released.
4. Repeat verification for microswitch located on top of cabinet in opposite direction.

Figure 7-8. Safety Cable Microswitch

7.8 QUICK-DISCONNECT PNEUMATIC FITTINGS

To remove tubing from a quick-disconnect pneumatic fitting (connector) that must be replaced, push outer ring inward and pull on tubing for release.

7.9 THERMOSTATIC STEAM TRAP REPLACEMENT

If steam trap stays open or closed all the time, replace as follows:

1. Lock unit electrical disconnect switch in OFF.
2. Remove steam trap from unit.
3. Reconnect two parts of steam trap together and reinstall in unit.
4. Unlock unit electrical disconnect switch, position to ON and open unit supply valves.
5. Check for proper operation.

7.10 HEAT EXCHANGER CONTROL ADJUSTMENTS

Washer is equipped with a steam heat exchanger and valving system to preheat fill water. Fill water temperature can be controlled by adjusting throttling valves

which regulate flow of steam and hot water through heat exchanger as follows:

1. Completely close steam throttling valve and fully open building hot water supply throttling valve (see Figure 7-9).
2. Drain chamber sump by selecting DRAIN function from Manual Menu and pressing **START** touch pad.
3. After display screen indicates that sump is empty, select FILL function from Manual Menu and press **START** touch pad.
4. Check reading on heat exchanger temperature gauge. Gauge indicates temperature of fill water after water passes through heat exchanger.
5. Slowly open steam throttling valve until temperature gauge reads desired temperature.

   NOTE: Recommended fill water temperature is 180° to 190°F (82° to 88°C).
6. If gauge does not reach desired temperature after steam throttling valve is fully open, slowly close building hot water supply throttling valve until desired temperature is reached.

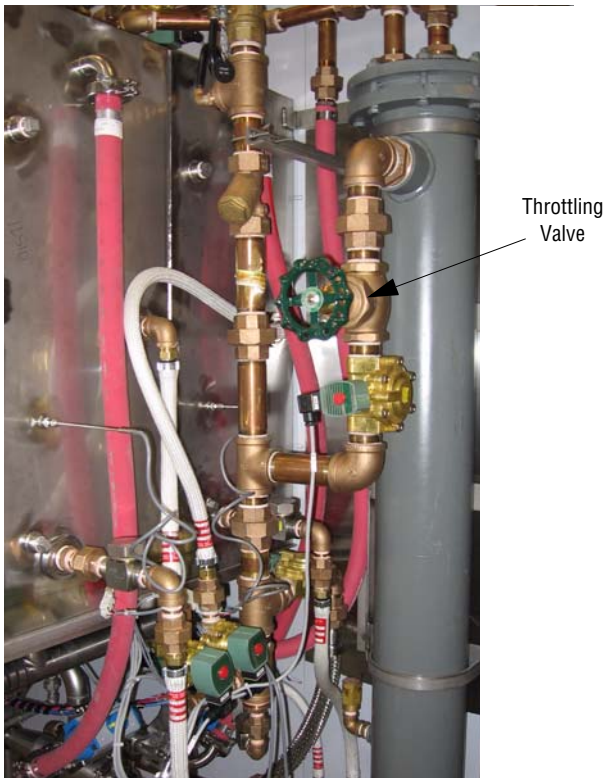


Figure 7-9. Heat Exchanger Throttling Valve

7.11 HOW TO REPLACE pH CONTROLLER

NOTE: pH Controller must be initialized and calibrated after replacement. See Section 7.13, How to Adjust pH Controller *AND* Section 7.14, How to Replace pH Sensor (pH Neutralizing System Option).

⚠ WARNING – ELECTRIC SHOCK AND/OR BURN HAZARD: Disconnect all utilities to unit before servicing. Do not service unit unless all utilities have been properly locked out. Always follow local electrical codes and safety-related work practices.

1. Lock unit electrical disconnect switch in OFF position.
2. Open Main Electrical Box cover and locate pH controller at the bottom of the cover.
3. Disconnect all wires on terminals TB1, TB2 and TB3 on controller.
4. Remove screws on each corner of controller and remove controller.
5. Install new controller and reconnect all wires on terminals TB1, TB2 and TB3 at their same location. Refer to *electrical schematic* #920509-795, in Reference Drawings Section, if necessary.

7.12 HOW TO CALIBRATE CONTROLLER OUTPUT SIGNALS

- Material Required:

  Loop Calibrator

7.12.1 Conductivity (Channel A)

Install loop calibrator as follows (see Figure 7-10):

a. Position washer power switch to **OFF**.

b. Connect loop calibrator to Thornton controller conductivity output. Make a serial connection.

c. Ensure loop calibrator is in Read mode (scale 4-20 ma).

d. Position washer power switch to **ON**.

- Output Calibration:

  Washer power switch must be **ON**.

1. Enter in Service Mode as explained in section 2.
2. Press Machine Service touch pad. Screen advances to Machine Service Screen.
3. Press **CALIBRATION** touch pad.

   On Thornton controller:
4. Press **CALIBRATION** button.

5. Press **UP** arrow to select Analog, then press on **OK/NEXT** button. Display shows:

Cal analog Ch 1

6. Press **OK/NEXT** button. Display shows:

1 : Adj 4mA=10329*

** this value is just an example.*

*NOTE: If loop calibrator does not show **4 ma**, on Thornton controller press **UP, DOWN, RIGHT** or **LEFT** arrows until signal in loop calibrator displays 4 ma.*

On washer control panel:

7. Press **CONDUCTIVITY SENSOR** touch pad. Display shows Low point screen.
8. Press **START** touch pad. Display shows Low Point Adjustment screen.
9. In Low Point Adjustment screen, press **CHANGE VALUES** touch pad. A numeric keyboard appears.
10. Enter **100** on numeric keyboard and press **ENTER** touch pad. Display shows High Point screen.

On Thornton controller:

11. Press **OK/NEXT** button. Display shows:

1 : Adj 20mA= 52708*

** this value is just an example.*

*NOTE: If loop calibrator does not show **20 ma**, on Thornton controller press **UP, DOWN, RIGHT** or **LEFT** arrows until signal in loop calibrator displays 20 ma.*

On washer control panel:

12. In High Point screen, press **START** touch pad. Display shows High Point Adjustment screen.
13. In High Point Adjustment screen, press **CHANGE VALUES** touch pad. A numeric keyboard appears.
14. Enter **40000** on numeric keyboard. Press **ENTER** touch pad.
15. Summary of Values screen appears; then press **OK** touch pad to end conductivity calibration signal.

On Thornton controller:

16. Press **OK/NEXT** button, display shows:

Save Changes Yes

17. Press **OK/NEXT** button to end channel conductivity calibration.

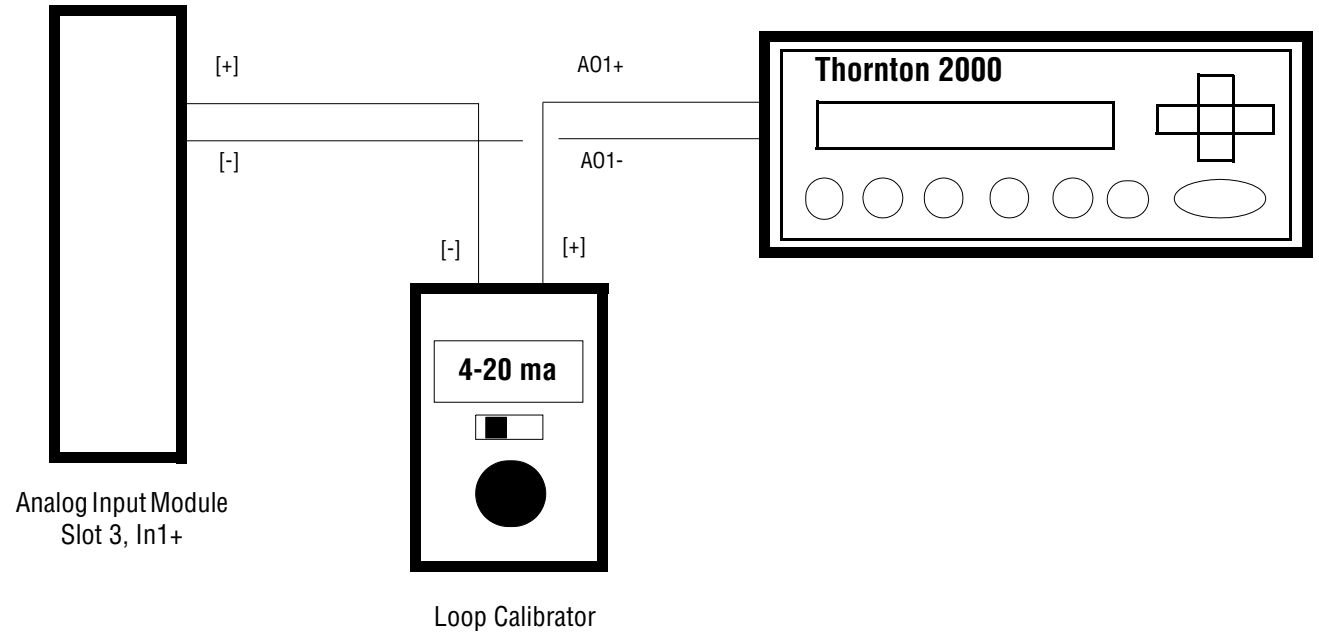


Figure 7-10. Install Loop Calibrator (Channel A)

7.12.2 pH (Channel B)
Only for Units with pH Option

Install loop calibrator as follows (see Figure 7-11):

a. Position washer power switch to **OFF**.

b. Connect loop calibrator to Thornton controller pH output. Make a serial connection.

c. Ensure loop calibrator is in Read mode (scale 4-20 ma).

d. Position washer power switch to **ON**.

- Output Calibration:

Washer power switch must be **ON**.

1. Enter in Service Mode as explained in Section 2.1, How to Enter Service Mode.
2. Press **MACHINE SERVICE** touch pad. Screen advances to Machine Service Screen.
3. Press **CALIBRATION** touch pad.

On Thornton controller:

4. Press **CALIBRATION** button.
5. Press **UP** arrow to select **Analog**, then press on **OK/NEXT** button. Display shows:

Cal analog Ch 1

6. Press **UP** arrow to select **Channel 2,** then press on **OK/NEXT** button. Display shows:

Cal analog Ch 2

7. Press **OK/NEXT** button. Display shows:

2 : Adj 4mA= 10329*

** this value is just an example.*

*NOTE: If loop calibrator does not show **4 ma**, on Thornton controller press **UP, DOWN, RIGHT** or **LEFT** arrows until signal in loop calibrator displays 4 ma.*

On washer control panel:

8. Press **pH SENSOR** touch pad. Display shows Low Point screen.
9. Press **START** touch pad. Display shows Low Point Adjustment screen.
10. In Low Point Adjustment screen, press **CHANGE VALUES** touch pad. A numeric keyboard appears.
11. Enter **1** on numeric keyboard and press **ENTER** touch pad. Display shows High Point screen.

On Thornton controller:

12. Press **OK/NEXT** button. Display shows:

2 : Adj 20mA= 52708*

** this value is just an example.*

*NOTE: If loop calibrator does not show **20 ma**, on Thornton controller press **UP, DOWN, RIGHT** or **LEFT** arrows until signal in loop calibrator displays 20 ma.*

On washer control panel:

13. In High Point screen, press **START** touch pad. Display shows High Point Adjustment screen.
14. In High Point Adjustment screen, press **CHANGE VALUES** touch pad. A numeric keyboard appears.
15. Enter **15** on numeric keyboard. Press **ENTER** touch pad.
16. Summary of Values screen appears; then press **OK** touch pad to end pH calibration signal.

On Thornton controller:

17. Press **OK/NEXT** button, display shows:

Save Changes Yes

18. Press **OK/NEXT** button to end pH channel calibration.

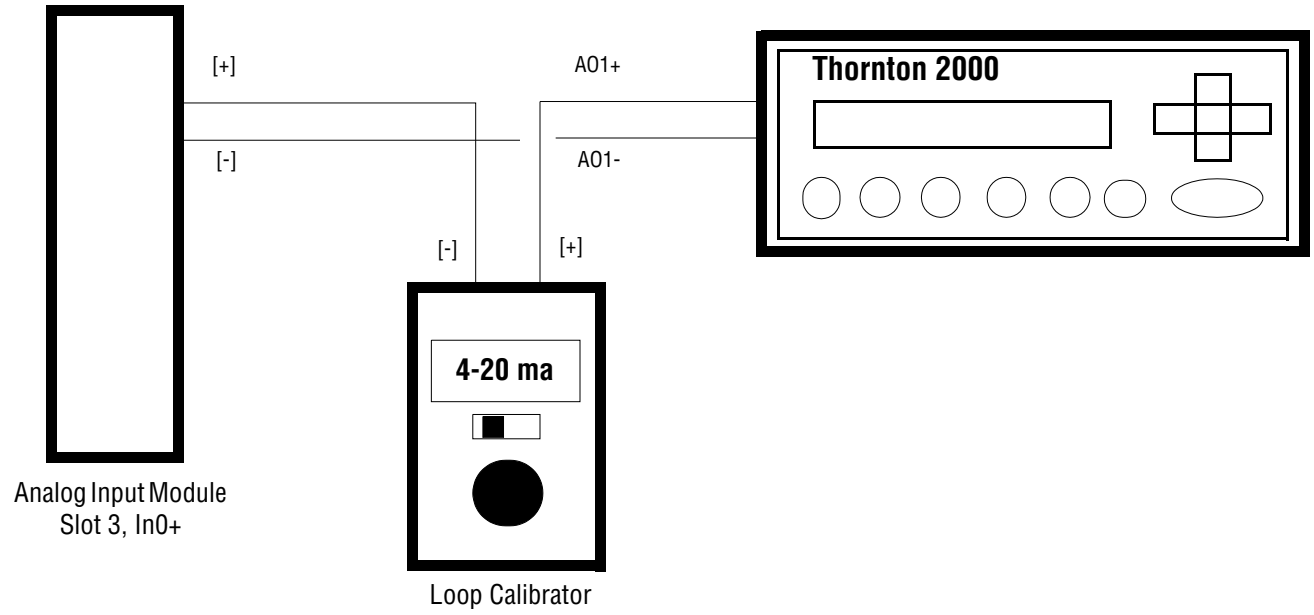


Figure 7-11. Install Loop Calibrator (Channel B)

7.13 HOW TO ADJUST pH CONTROLLER

7.13.1 Reset Control

1. Press **MENU** button.
2. Press **UP** arrow until **SYSTEM RESET** menu is displayed.
3. Press **OK/RESET** button. Display shows:

   Reset Unit? YES
4. Press **OK/RESET** button. Control is reset to 0.

7.13.2 Frequency Adjustment

1. Press **MENU** button.
2. Press **UP** arrow until **SET FREQUENCY** menu is displayed.
3. Press **OK/RESET** button. Display shows:

   Frequency = 60Hz
4. Press **UP** arrow to select 50 or 60 Hz as per washer's frequency.
5. Once frequency set, press **OK/RESET** button. Display shows:

   Save Changes Yes
6. Press **OK/RESET** button again to confirm frequency.

7.13.3 Measure Units Adjustment

1. Press **MEASURE MODE** button. Display shows:

   A = S/cm (Micro)
2. Press **RIGHT** arrow to select **MICRO**.
3. Press **UP** arrow until **AUTO** appears on display:

   A = S/cm (Auto)
4. Press **OK/RESET** button, display shows:

   a = Deg C (_)
5. Use **LEFT** arrow to place underscore under **D**. Display must show:

   a = Deg C ( )
6. Press **OK/RESET** button, display shows:

   B = S/cm (Micro)
7. Press **UP** arrow until **pH** appears on display:

   B = pH
8. Press **OK/RESET** button, display shows:

   b = DegC ( )
9. Press **OK/RESET** button to confirm modifications.

7.13.4 Analog Output Adjustment

- **Channel 1 Adjustment:**

1. Press **OUTPUT** button. Display shows:

   Output: Analog

2. Press **OK/RESET** button, display shows:

Aout1 signal = __

3. Press **RIGHT** arrow once to move cursor to underscore position to enter signal value from conductivity sensor corresponding to analog output 1. Display shows:

Aout1 signal = __

4. Press **UP** arrow until **A** appears on display:

Aout1 signal = A

5. Press **OK/RESET** button, display shows:

Aout1 Min = 0.000_

6. Use **ARROWS** to enter 100.0µ. Display shows:

Aout1 Min = 100.0µ

7. Press **OK/RESET** button, display shows:

Aout1 Max = 0.000_

8. Use **ARROWS** to enter 40.00µ, display shows:

Aout1 Max= 40.000µ.

9. Press **OK/RESET** button, display shows:

Aout1 Mid = 0.000_

10. Press **OK/RESET** button, display shows:

1 : If err set Max

11. Press **UP** arrow until **Min** appears on display:

1 : If err set Min

12. Press **OK/RESET** button, display shows:

Save Changes Yes

13. Press **OK/RESET** button to confirm modifications.

- **Channel 2 Adjustment:**

1. Press **OUTPUT** button. Display shows:

Output: Analog

2. Press **OK/RESET** button, display shows:

Aout1 signal = __

3. Press **UP** arrow until 2 appears on display:

Aout2 signal = __

4. Press **RIGHT** arrow once to move cursor to underscore position to enter signal value from pH sensor corresponding to analog output 2. Display shows:

Aout2 signal = __

5. Press **UP** arrow until B appears on display:

Aout2 signal = B

6. Press **OK/RESET** button, display shows:

Aout2 Min = 0.000_

7. Use **ARROWS** to enter 1.00, display must show:

Aout2 Max = 1.00_

8. Press **OK/RESET** button, display shows:

Aout2 Max = 0.000_

9. Use **ARROWS** to enter 15.00, display must show:

Aout2 Max = 15.00_

10. Press **OK/RESET** button, display shows:

Aout2 Mid = 0.000_

11. Press **OK/RESET** button, display shows:

2 : If err set Max

12. Press **UP** arrow until Min appears on display:

2 : If err set Min

13. Press **OK/RESET** button, display shows:

Save Changes Yes

14. Press **OK/RESET** to confirm modifications.

7.13.5 Thornton Display Adjustment:

1. Display must show:

A*.S B*.**pH**

2. Press **UP** arrow until right information appears on display.

7.14 HOW TO REPLACE pH SENSOR (pH NEUTRALIZING SYSTEM OPTION)

NOTE: pH Controller must be calibrated after sensor replacement.

1. Lock unit electrical disconnect switch in **OFF** position.
2. Locate and drain neutralizing pump piping.
3. Locate pH sensor, unplug connector and remove.
4. Remove cap on new pH probe, install and plug connector.
5. Perform calibration (refer to Section 2.5, Thornton Controller).

7.15 RTD REPLACEMENT

There are four RTDs:

- Sump RTD (**Sump RTD**) is located in chamber sump;
- Alkaline tank and/or acid tank RTD is locted on side of respective tank;

- Cooldown side tank RTD **(CDT RTD):**

  For units with cooldown side tank option, CDT RTD is located on left side of cool down tank, on service side;

1. Lock unit electrical disconnect switch in **OFF** position.
2. Locate and unplug defective RTD cable connector.
3. Loosen RTD compression fitting and remove RTD and compression fitting.
4. Put Teflon tape on a new compression fitting thread and install it.
5. Insert completely new RTD inside compression fitting and tighten.
6. Plug RTD cable connectors and attach extra cable to avoid contact with hot surfaces if necessary.
7. Put unit electrical disconnect switch to ON position.
8. Enter Service Mode (refer to Section 2.1, How to Enter Service Mode).

NOTE: After any repair is complete, after a few weeks of operation, inspect unit for leaks. If necessary, retighten all clamps and connections.

MAINTENANCE MANUAL

Illustrated Parts Breakdown
Basil® 4700 Cage and Rack Washer

(2008/10/15) **P764333-099**

LIST OF FIGURES

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Illustrated Parts Breakdown

IMPORTANT: *A listing of the Safety Precautions to be observed when operating and servicing this Cage and Rack Washer can be found in SECTION 1 of this manual. Do not operate or service the equipment until you have become familiar with this information.*

Significant assemblies and components of the Basil® 4700 Cage and Rack Washer are illustrated and identified in this section. The part number, the description, and the quantity required for each usage are given. Each indentation in the description represents the assembly level. The UNITS PER ASSEMBLY column is specific for the given assembly or subassembly level.

WARNING – PERSONAL INJURY HAZARD AND/OR EQUIPMENT DAMAGE: Repairs and adjustments to this equipment must be made only by STERIS or STERIS-trained service personnel. Nonroutine maintenance performed by unqualified personnel or installation of unauthorized parts could cause personal injury, result in improper equipment performance, void the warranty, or result in costly damage. Contact STERIS regarding service options.

CAUTION – POSSIBLE EQUIPMENT DAMAGE: To prevent voiding the warranty or damaging the equipment, use only authorized STERIS parts.

9.1 HOW TO USE ILLUSTRATED PARTS BREAKDOWN

- Determine the function and application of the part required. Select the most appropriate title from the List of Illustrations in the Table of Contents. Note the illustration page number.
- Turn to the page indicated and locate the desired part on the illustration.
- From the illustration, obtain the item number assigned to the desired part. Refer to the accompanying tabular list (usually on the facing page) for the part number and description of the part.
- The abbreviation A/R means "as required" or "amount required".
- The abbreviation S/S means "stainless steel".

9.2 PREVENTIVE MAINTENANCE PACKS

Repair parts needed to perform preventive maintenance of equipment components are grouped together in Preventive Maintenance (PM) packs. PM packs allow the customer to order all necessary repair kits using one part number.

Typical Indentation Example

No indentation – part of top assembly

One indentation – first subassembly, part of assembly under which it is indented

9-2	P	146655	023		ARM AND LIGHTHEAD ASSEMBLY .....
1	P	136807	181		CAP .....
2	P	136807	981		FUNNEL CONE ASSEMBLY.....
	P	136807	979		• CAP, Shield .....
	P	129362	378		• CLIP, Locking .....
	P	93911	304		• CONE, Cap .....
	P	136807	980		• FUNNEL, Cap.....
3	P	83628	001		SCREW, Button Head, #6-32 x 3/8 Lg
4	P	19684	061		LOCKWASHER, Helical, #6 .....
5	P	90713	061		LOCKWASHER, Helical, #4 .....
6	P	47760	091		SCREW, Button Head, #4-40 x

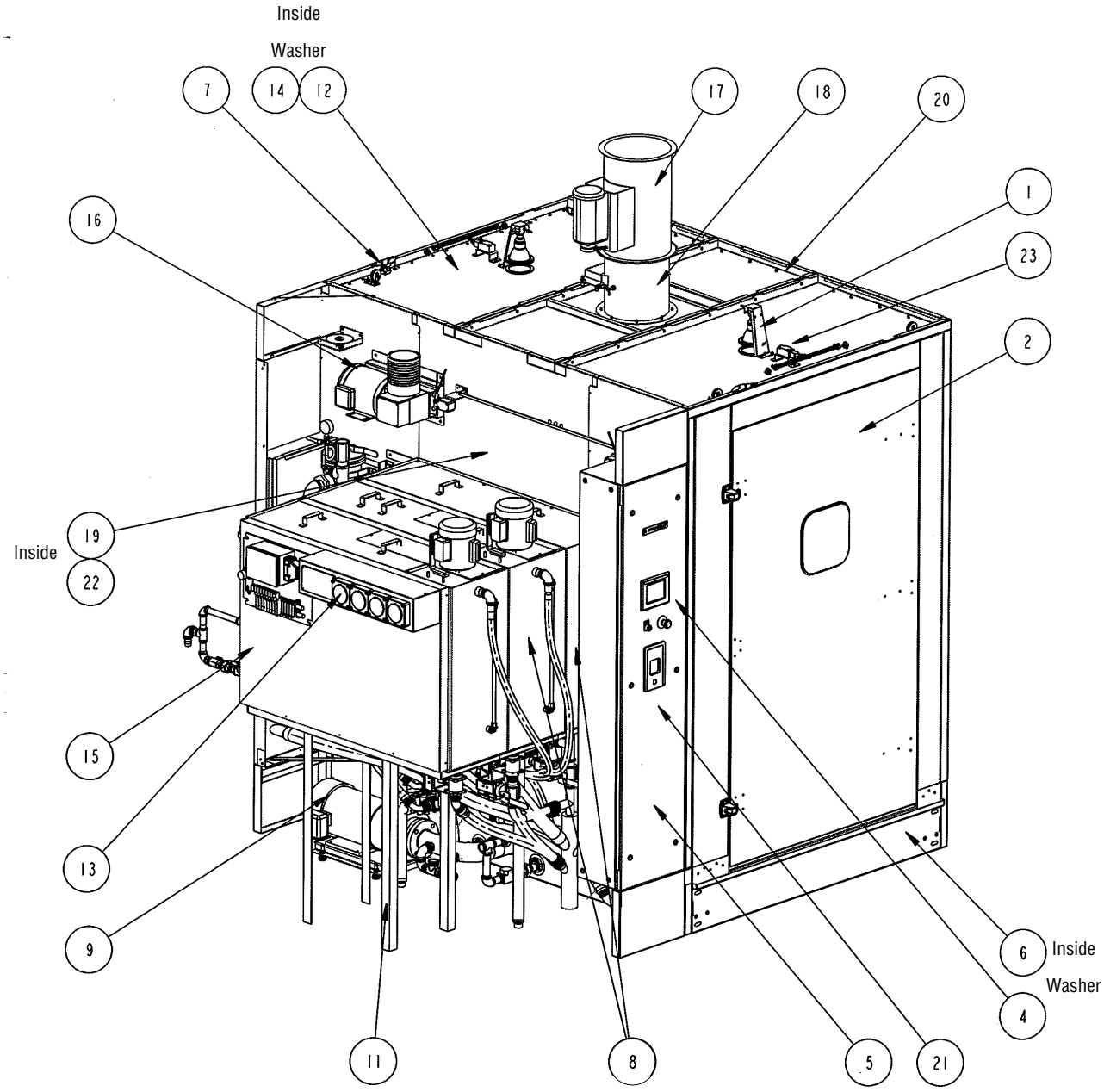
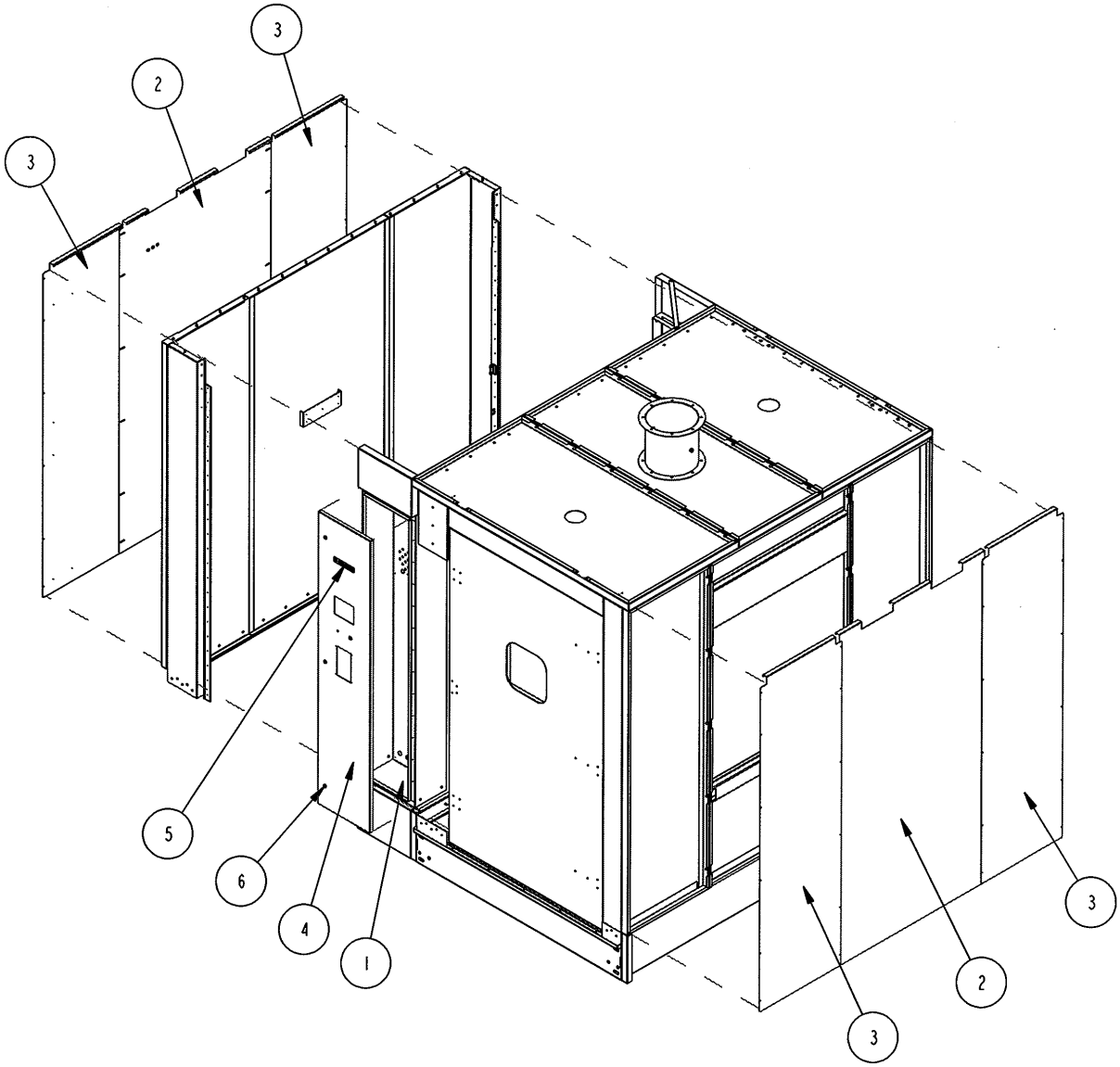


Figure 1. Basil 4700 Cage and Rack Washer

FIG. & ITEM NO.	PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
1		**BASIL 4700 CAGE AND RACK WASHER .....**	**X**
1		INTERIOR LIGHT Assembly (see Figure 6)	
2		DOOR Assembly (see Figure 4)	
3		SEISMIC TIE-DOWN ANCHORAGE – Option (Not Shown, see Figure 27)	
4		CONTROL PANEL Assembly (see Figure 26)	
5		ELECTRICAL BOX Assembly (see Figure 25a, 25b, 25c)	
6		SUMP AND FLOOR GRATING Assembly (see Figure 3)	
7		DOUBLE DOOR INTERLOCK SYSTEM (see Figure 5)	
8		SOLUTION TANK (see Figure 22)	
9		RECIRCULAION PUMP SYSTEM Assembly (see Figure 19)	
10		SELF-CLEANING FILTER Assembly (Not Shown, see Figure 19)	
11		TANK SUPPORT FRAME Assembly (see Figure 23)	
12		CABLE AND ROLLER Assembly (Not Shown, see Figure 9)	
13		PERISTALTIC CHEMICAL INJECTION PUMP Assembly (see Figure 21)	
14		SPRAY HEADER Assembly (see Figure 8)	
15		GUARANTEED COOLDOWN TANK, With or Without pH (see Figure 24)	
16		TRAVELER DRIVE AND LIMIT SWITCH Assembly (see Figure 10)	
17		EXHAUST FAN (see Figure 13)	
18		DAMPER (see Figure 12)	
19		AUTOMATIC WATER RACK FLUSH – Option (see Figure 11)	
20		CABINET Assembly (see Figure 2)	
21		ELECTRICAL BOX AND CONTROL PANEL (see Figure 25)	
22		FINAL RINSE SYSTEM Assembly – Option (see Figure 18)	
23		SAFETY EMERGENCY STOP CABLE (see Figure 7)	
		HOT WATER LINE COMPONENTS (Not Shown, see Figure 14)	
		COLD WATER LINE COMPONENTS (Not Shown, see Figure 15)	
		RECIRCULATION PIPING (Not Shown, see Figure 16)	
		STEAM LINE COMPONENTS (Not Shown, see Figure 17)	
		PNEUMATIC BLOCK (Not Shown, see Figure 20)	
		BOTTLE WASHING CART – WA02-010 (Not Shown, see Figure 28)	
		BOTTLE WASHING CART – WA02-020 (Not Shown, see Figure 29)	
		PAN CART – WA02-030 (Not Shown, see Figure 30)	
		UNIVERSAL CAGE AND PAN WASH CART – WA03-100 (Not Shown, see Figure 31)	
		UNIVERSAL CAGE WASH CART – WA02-040 (Not Shown, see Figure 32)	
		CART TILT RAMP – WA02-050 (Not Shown, see Figure 33)	
		FLOOR RAMP – WA02-060, For Floor-Mounted Units (Not Shown, see Figure 34)	



Left Side Control Shown

Figure 2. Cabinet Assembly

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
2				**CABINET ASSEMBLY**	**X**
1	P	117050	440	CONTROL BOX	1
2	P	117041	816	COVERING PANEL, 48" (Option)	2
3	P	117041	817	COVERING PANEL, 27" (Option)	4
4	P	117051	060	DOOR, Left, Control Box, With Printer	1
		117051	062	DOOR, Left, Control Box, Without Printer	1
		117050	442	DOOR, Right, Control Box, With Printer	1
		117051	061	DOOR, Right, Control Box, Without Printer	1
5	P	117052	513	ID PLATE, "STERIS Basil 4700"	2
6	P	117940	140	LOCK KIT, #M4585-8-001 W/CAM, 1- 7/8" Long	4

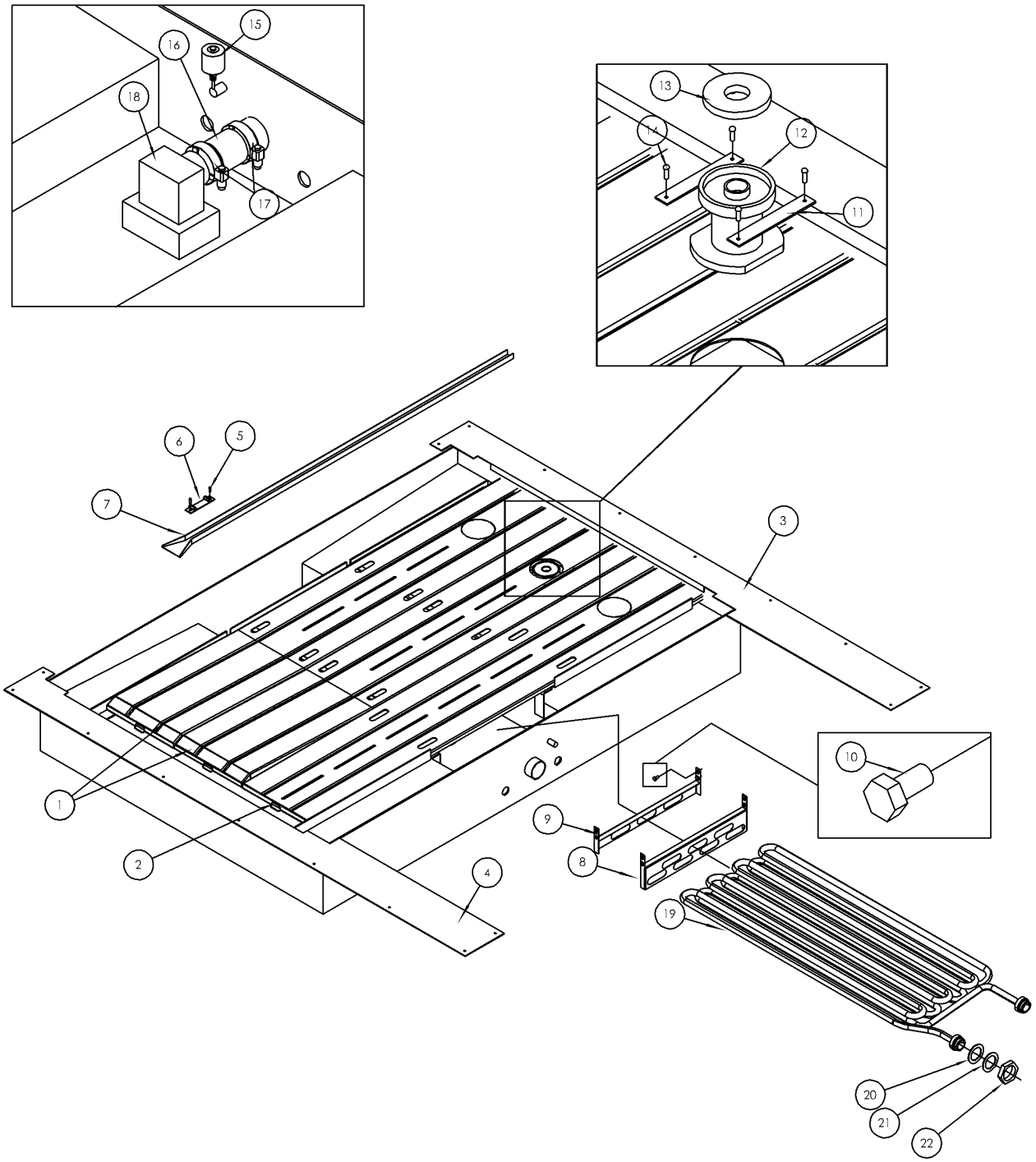


Figure 3. Sump and Floor Grating Assembly

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
3				**SUMP AND FLOOR GRATING ASSEMBLY**	**X**
1	P	117041	554	INCLINED FLOOR	3
2	P	117041	175	FLOOR	3
3	P	117940	687	FLANGE BASE, LH	1
4	P	117940	686	FLANGE BASE, RH	1
5	P	117950	834	SCREW, Flat Head, S/S, 10-32 x 1/4"	2
6	P	117992	828	STOPPER, Utensil Cart	1
7	P	117940	298	GUIDE, Cart,	1
8	P	117042	073	SUPPORT, Sump Steam Coil	1
9	P	117042	079	SUPPORT, Steam Coil	1
10	P	117950	898	BOLT, S/S, 1/4-20 x 3/8"	4
11	P	117940	280	RETAINER, Riser Valve	2
12	P	117951	624	INLET, Utensil Cart	1
13	P	117951	625	GASKET, Utensil Cart Inlet	1
14	P	117950	855	SCREW, Truss Head, S/S, 8-32 x 1/4", Nylok	4
15	P	117905	655	SENSOR, Water Level with Cover	1
16	P	117941	438	HOSE, Black, 3-1/2" x 4"	1
17	P	117950	792	CLAMP, S/S #64, 3-9/16" to 4-1/2"	2
18	P	117940	295	MANIFOLD, Suction	1
19	P	117041	211	STEAM COIL, Sump	1
20	P	117903	785	GASKET, Steam Coil, Viton	2
21	P	117903	786	GASKET, Steam Coil, Teflon	2
22	P	117903	787	NUT, Steam Coil	2

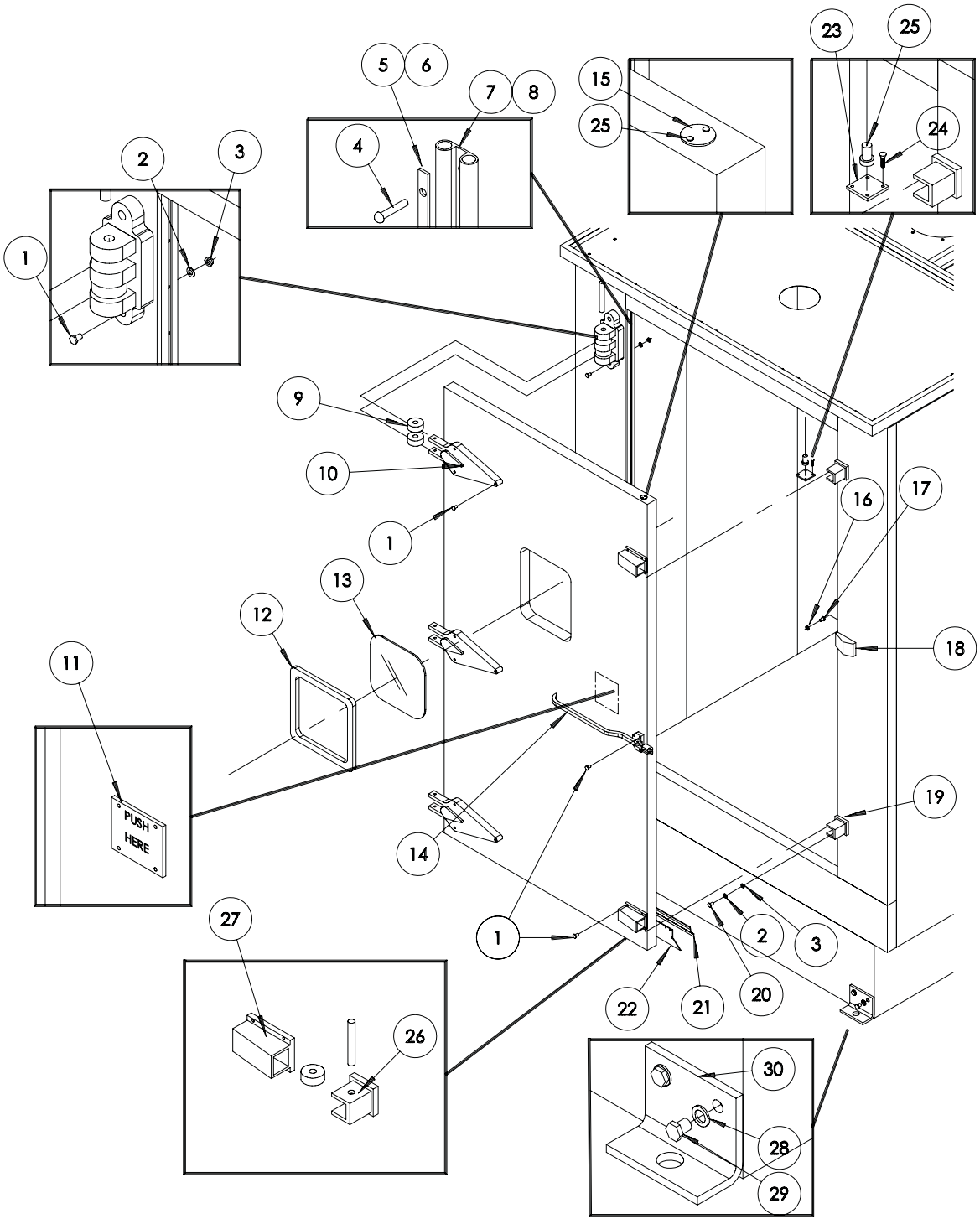


Figure 4. Door Assembly

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
4				**DOOR ASSEMBLY**	**X**
1	P	117959	849	SCREW, Flat Head, S/S, 1/4"-20 x 1"	6
2	P	117941	361	SEAL, Washer, 1/4" S/S-Neoprene	26
3	P	117950	971	CAPNUT, S/S, 1/4"-20	26
4	P	117950	850	SCREW, S/S, Truss Head, 6-32 x 3/8"	57
5	P	117940	308	RETAINER, Gasket, Door, 49-3/8"	1
6	P	117940	309	RETAINER, Gasket, Door, 85-1/4"	2
7	P	117993	134	GASKET, Door, Side Frame	2
8	P	117993	133	GASKET, Door, Upper Frame	1
9	P	117902	431	SPACER, Hinge	6
10	P	117940	115	HINGE, Flush Mount	3
11	P	117940	107	NAMEPLATE, "PUSH HERE"	1
12	P	117992	607	SEAL, Window	4
13	P	117940	294	GLASS, Door	1
14	P	117940	116	RELEASE HANDLE, Kasonized Finish	1
15	P	117940	801	SWITCH, Toggle	1
16	P	117941	362	SEAL, Washer, 5/16", S/S-Neoprene	2
17	P	117013	572	SCREW, Flat Head, S/S, 5/16"-18 x 3/4"	2
18	P	117940	281	BREAKAWAY PLATE	1
19	P	117941	227	SHIM, Adjustable Strike	2
20	P	117950	844	SCREW, S/S, Flat Head, 1/4"-20 x 1-1/4"	8
21	P	117942	179	RETAINING ANGLE, Door, Lower	1
22	P	117942	180	GASKET, Door, Lower	1
23	P	117941	162	PLATE, Door Switch	1
24	P	117950	819	SCREW, S/S, Flat Head, 6-32 x 3/8"	4
25	P	117940	801	SWITCH	1
26	P	117943	105	STRIKE, Adjustable	2
27	P	117940	117	TRIGGER, Grip-body, Chrome-Plated	2
28	P	117950	989	LOCKWASHER, S/S, 1/2"	8
29	P	117906	771	BOLT, S/S, 1/2"-13 x 1"	8
30	P	117990	574	ANGLE, SEISMIC, Tie, Brace, Angle	4

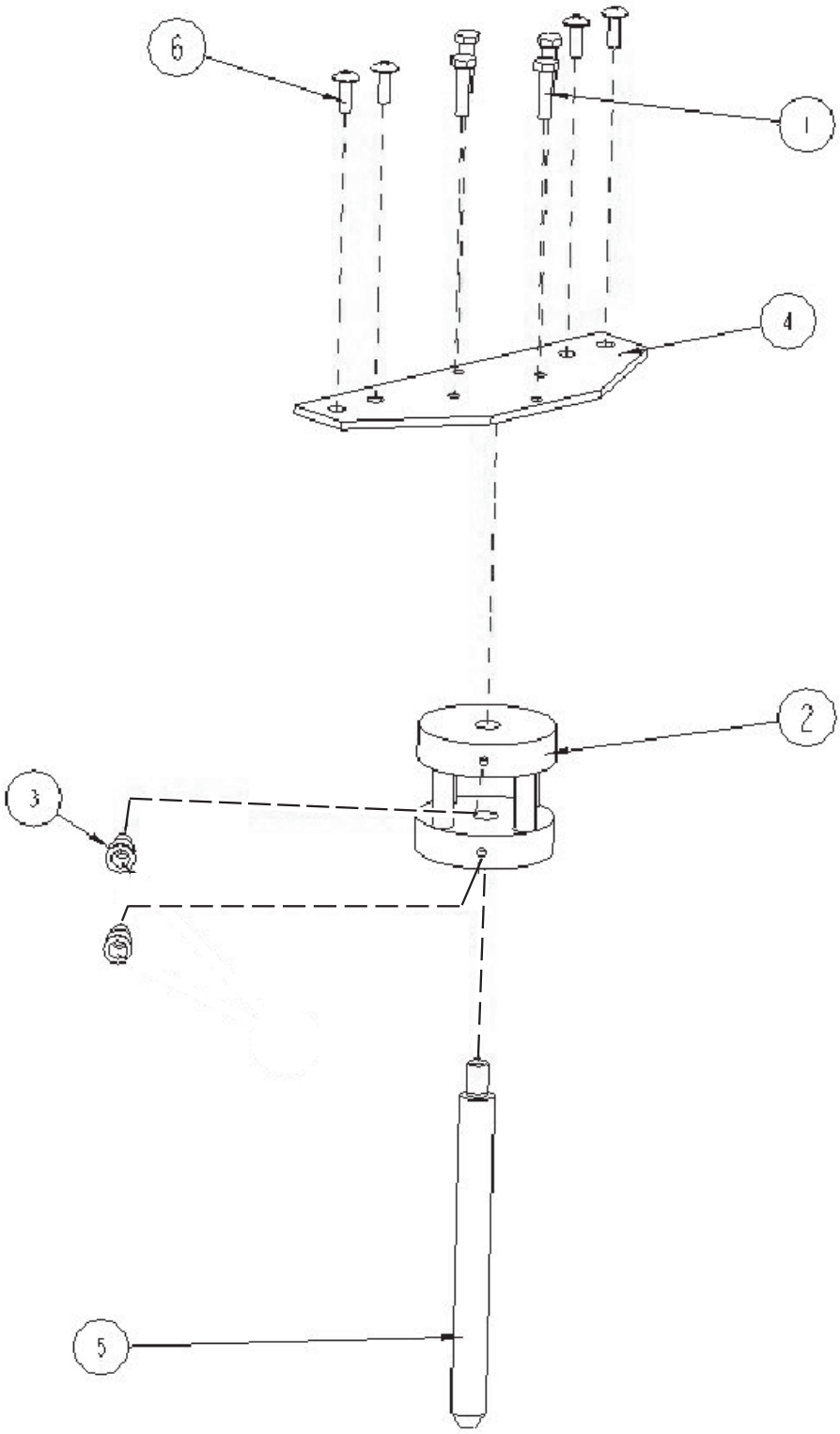


Figure 5. Double Door Interlock System

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
5				**DOUBLE DOOR INTERLOCK SYSTEM**	**X**
1	P	117950	896	BOLT, S/S, 10-32 x 3/4"	8
2	P	117915	032	CYLINDER, Pneumatic	2
3	P	117951	836	ADAPTOR, Pneumatic, 1/8" M x 1/4"OD	4
4	P	117043	249	SUPPORT, Interlock	1
5	P	117041	774	ROD, Door	2
6	P	117910	384	SCREW, Truss Head, S/S,	8

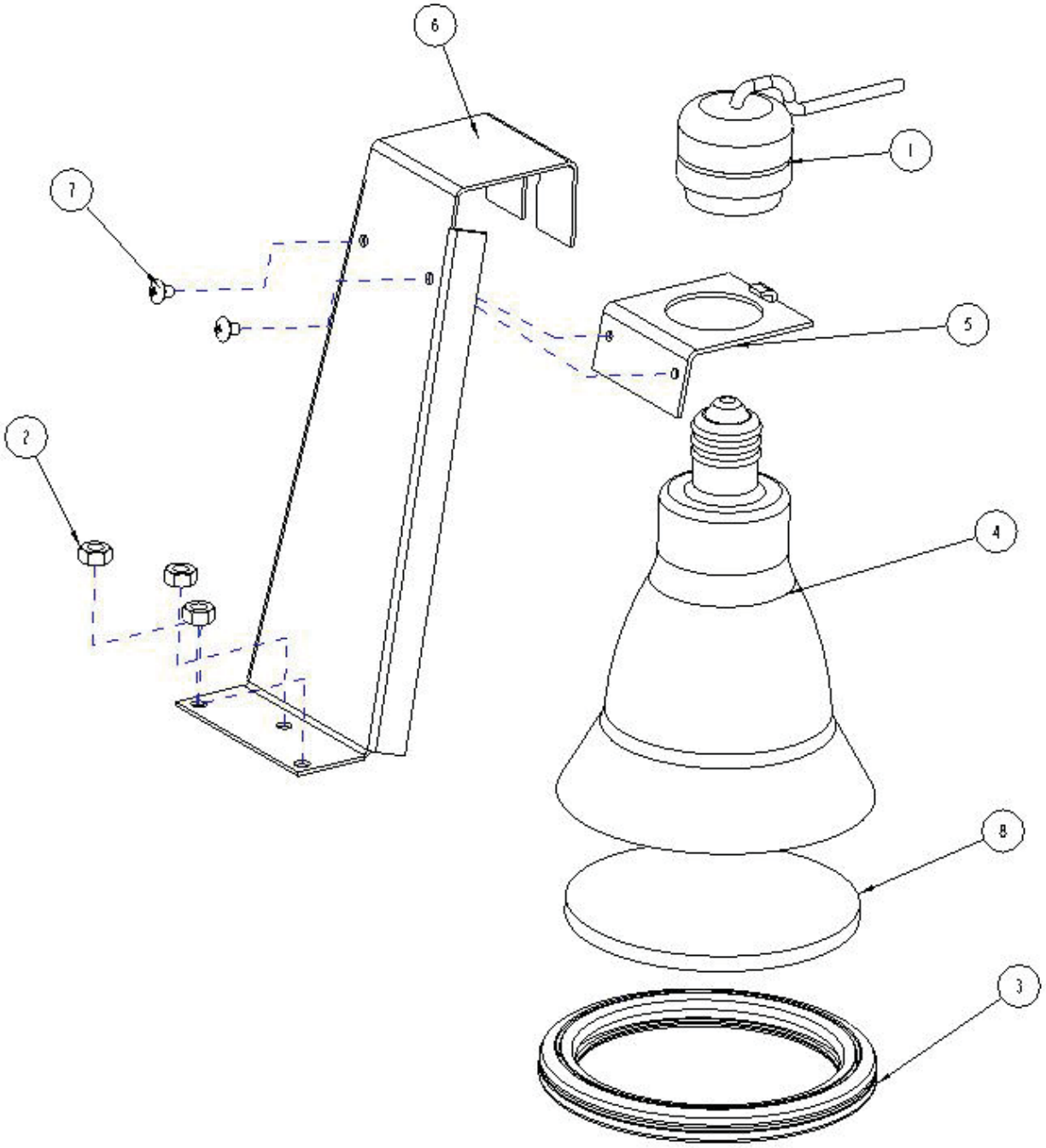


Figure 6. Interior Light

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
6				**INTERIOR LIGHT**	**X**
1	P	117903	815	SOCKET, Interior Light	1
2	P	117950	952	NUT, S/S, 1/4"-20	3
3	P	117906	137	GASKET, Light	1
4	P	117906	132	DEFLECTOR, Fluorescent 23 W, Large Beam	1
5	P	117906	134	HOLDER, Socket	1
6	P	117906	133	HOLDER, Interior Light	1
7	P	117950	855	SCREW, Truss Head, S/S, 8-32 x 1/4", Nylok	2
8	P	117906	131	GLASS, Round, Tempered, 4-1/2"	1

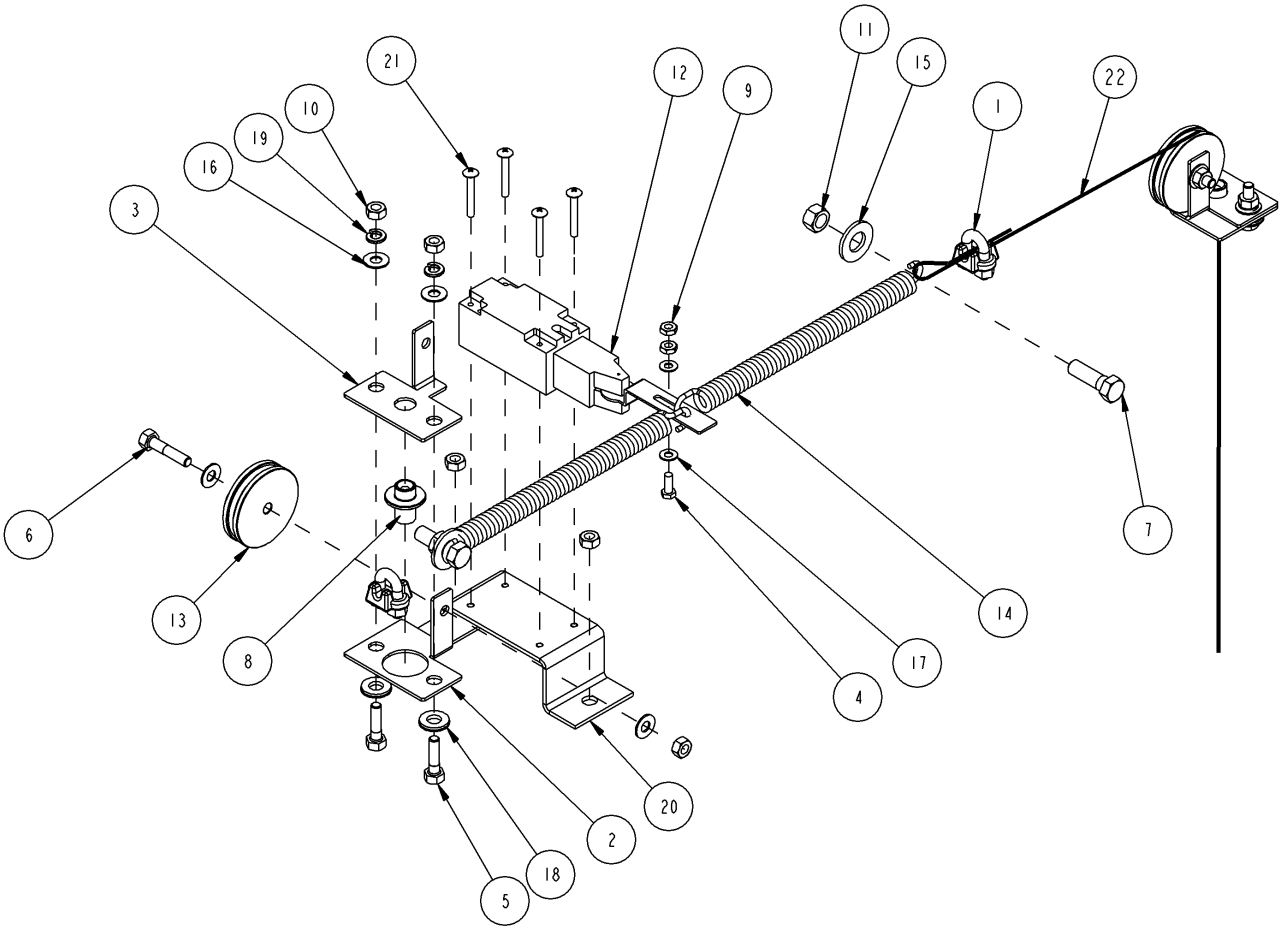


Figure 7. Safety Emergency Stop Cable Assembly

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
7				**SAFETY EMERGENCY STOP CABLE ASSEMBLY**	**X**
1	P	117940	104	CLIP, Wire Rope, S/S, 3/16"	2
2	P	117040	164	BASE, Emergency Stop	2
3	P	117040	165	BASE, Emergency Stop, Reverse	2
4	P	117950	895	BOLT, S/S, 10-32 x 1/2"	1
5	P	117950	901	BOLT, S/S, 1/4"-20 x 1"	4
6	P	117950	902	BOLT, S/S, 1/4"-20 x 1-1/4"	2
7	P	117957	207	BOLT, S/S, 3/8"-16 x 1 1/4"	2
8	P	117024	692	BUSHING, Cable, Emergency Stop	2
9	P	117950	951	NUT, S/S, 10-32	2
10	P	117950	952	NUT, S/S, 1/4"-20	8
11	P	117950	955	NUT, S/S, 3/8"-16	2
12	P	117037	693	SWITCH, Cable, Emergency Stop	1
13	P	117026	292	PULLEY, UHMW, 2"	2
14	P	117950	040	SPRING, Door, Emergency Stop	2
15	P	117950	979	WASHER, S/S, 1/2"	2
16	P	117950	976	WASHER, S/S, 1/4"	10
17	P	117950	975	WASHER, S/S, 3/16"	2
18	P	117941	361	SEAL, WASHER, 1/4", S/S-Neoprene	4
19	P	117950	986	LOCKWASHER, S/S, 1/4"	6
20	P	117041	795	SUPPORT, Sensor, Emergency Stop	1
21	P	117950	861	SCREW, S/S, Truss Head, 8-32 x 1-1/4"	4
22	P	117940	101	WIRE ROPE, S/S, Red-coated, 7 x 7, 3/16" OD	30’

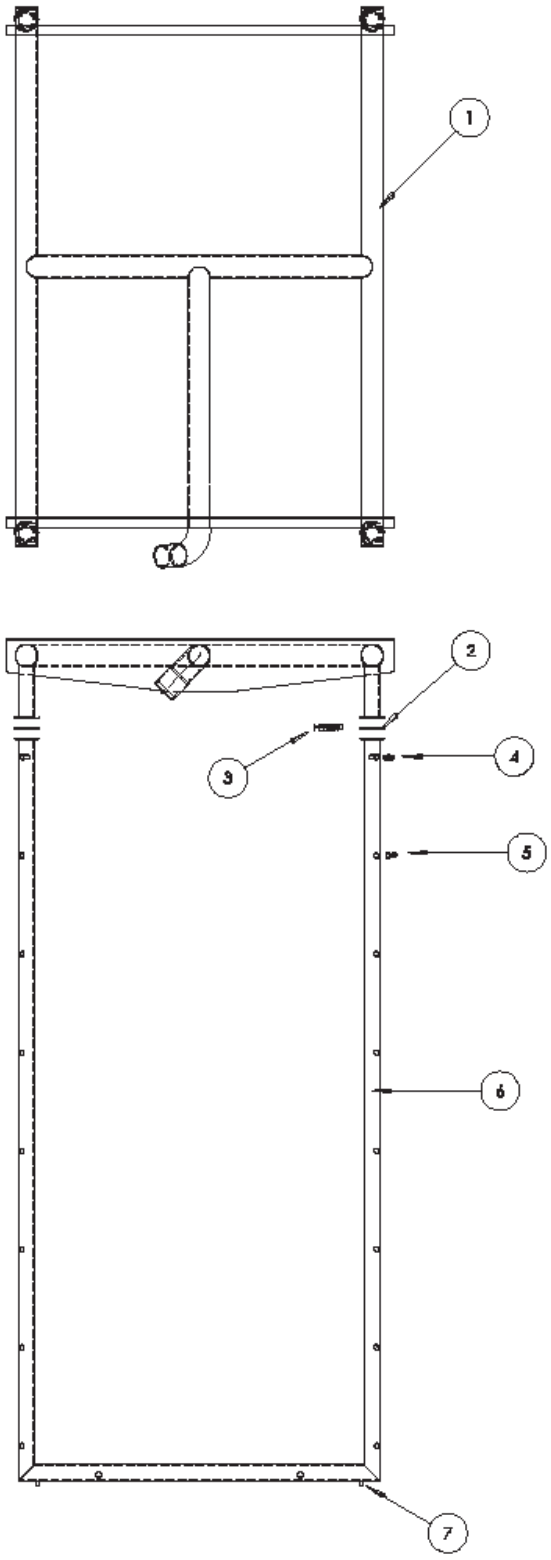


Figure 8. Spray Header Assembly

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
8				**SPRAY HEADER ASSEMBLY**	**X**
1	P	117992	888	SPRAY HEADER, Top	1
2	P	117951	568	GASKET, Silicone, 2"	4
3	P	117950	808	CLAMP, Quick Disconnect, 2"	4
4	P	117940	055	JET, 1/4F, S/S	4
5	P	117941	437	JET, S/S, 3/8"	40
6	P	117992	890	SPRAY HEADER	2
7	P	117952	206	PLUG, S/S, 3/8"M	4
	P	117990	116	HOSE, Traveller, 2-1/2" X 7' (Not Shown)	A/R

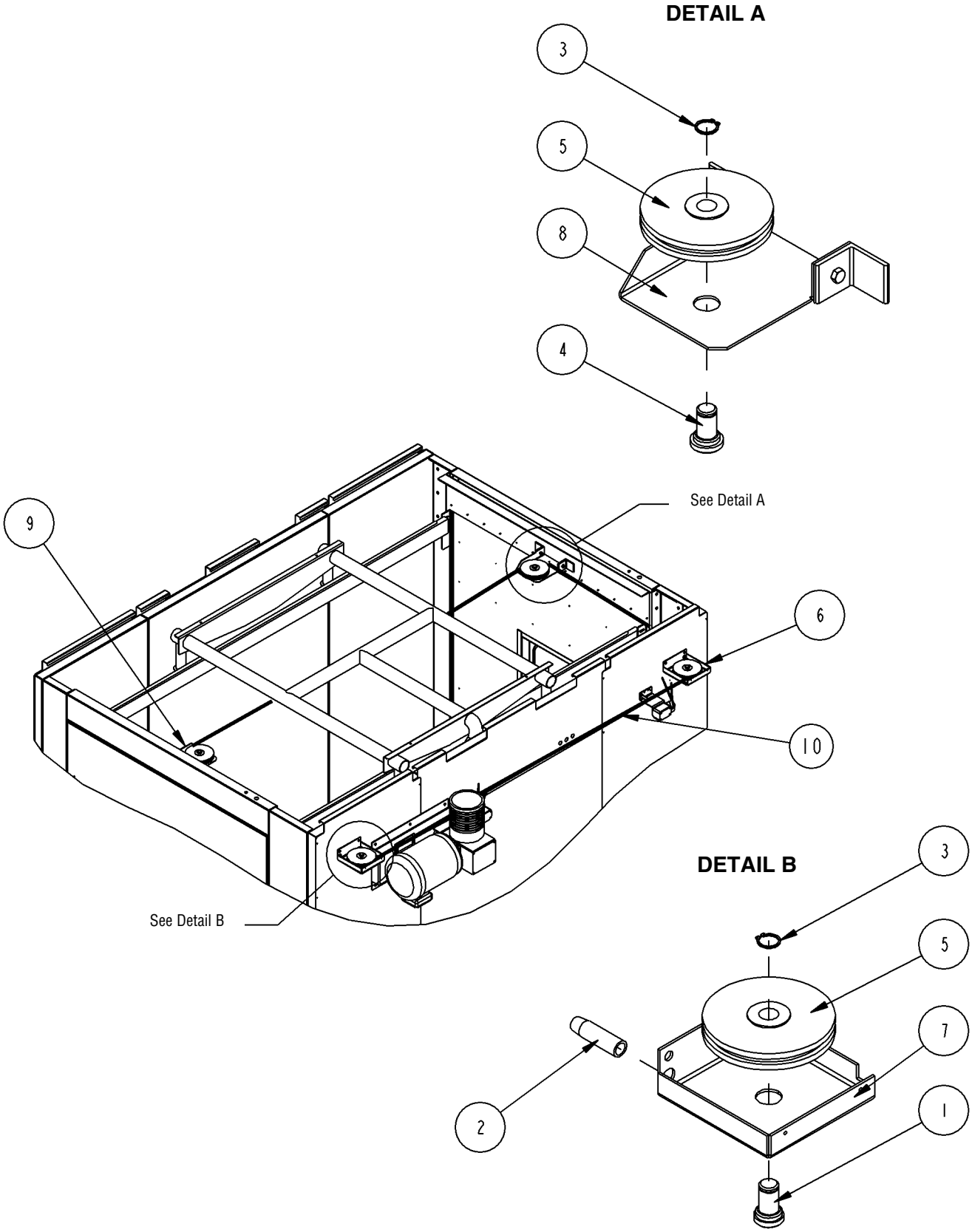


Figure 9. Cable and Roller Assembly

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
9				**CABLE AND ROLLER ASSEMBLY**	**X**
1	P	117010	671	BEARING POST	2
2	P	117044	626	GUIDE, Cable	2
3	P	117940	105	RING, Retaining	4
4	P	117940	249	GUIDE, Cable	2
5	P	117940	252	ROLLER, Drive	4
6	P	117940	254	BRACKET, Outside Roller Support, Right	1
7	P	117940	256	BRACKET, Outside Roller Support, Left	1
8	P	117940	344	PLATE, Inside Roller Support, Right	1
9	P	117940	345	PLATE, Inside Roller Support, Left	1
10	P	117940	100	CABLE, S/S, 3/16" 7 x 19 Hanes Wire Rope	265’

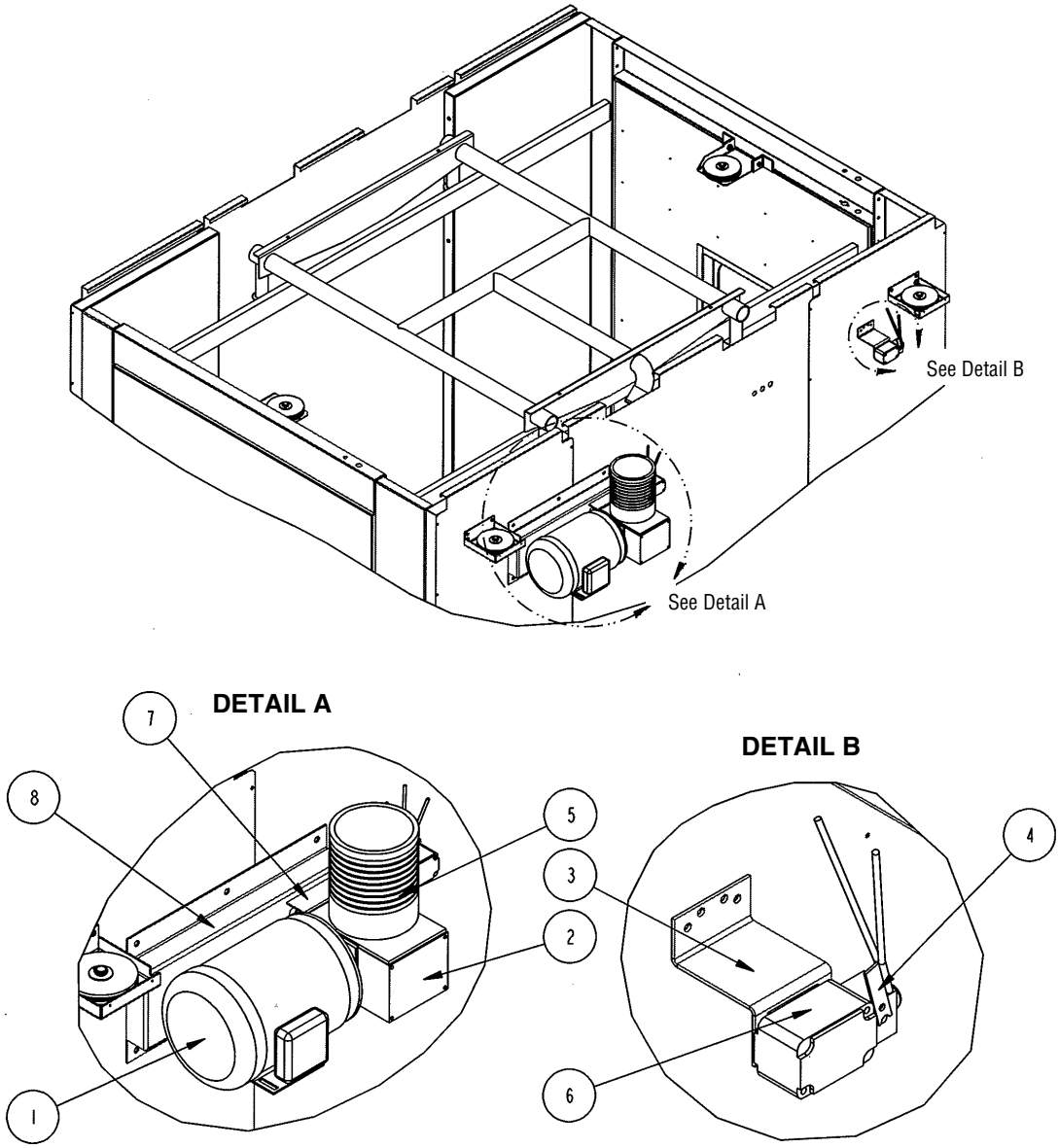


Figure 10. Traveler Drive and Limit Switch Assembly

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
10				**TRAVELER DRIVE AND LIMIT SWITCH ASSEMBLY**	**X**			
1	P	117940	062	MOTOR, 1/3 hp, 208/230/460 V, 3-phase, 1140 RPM	1			
2	P	117940	063	GEAR BOX	1			
3	P	117940	271	SUPPORT, Microswitch	1			
4	P	117940	301	SWITCH, Limit, Drive	2			
5	P	117940	326	CAPSTAN	1			
6	P	117951	091	SWITCH, Limit	2			
7	P	117940	323	BASE, Capstan	1			
8	P	117940	323	BASE, Capstan	1			

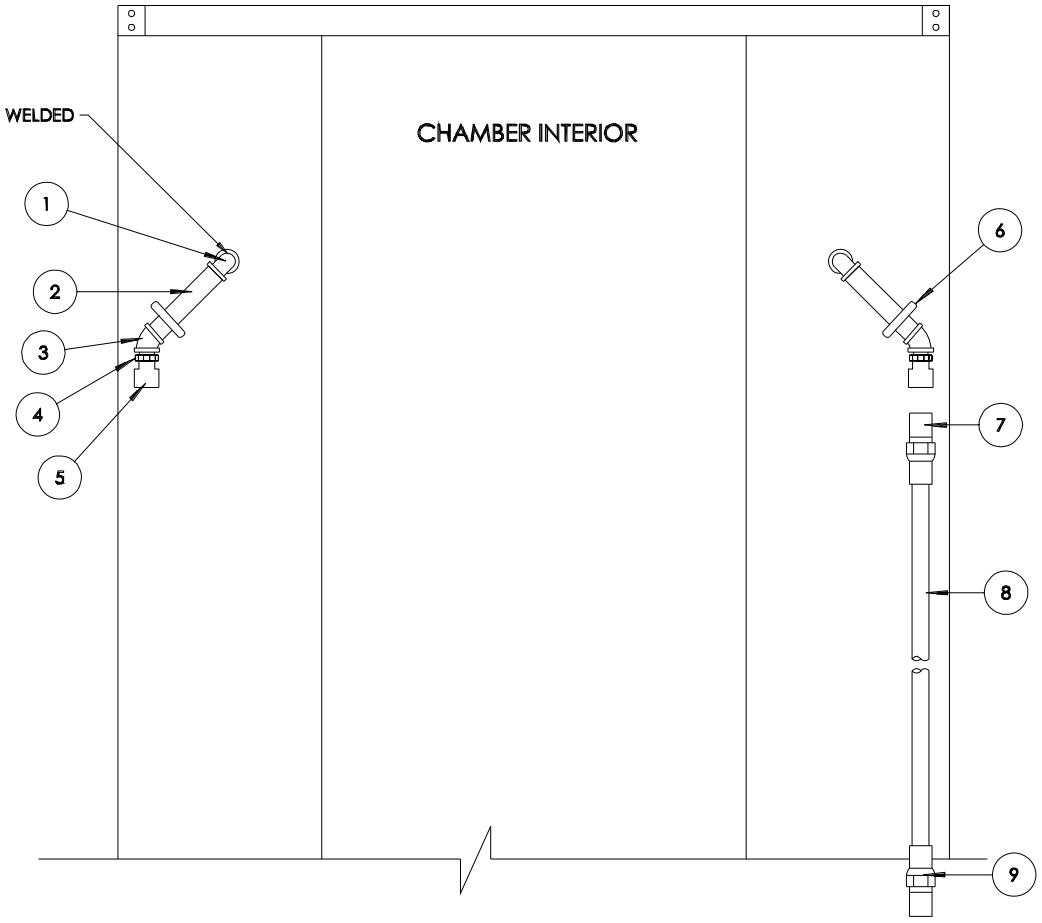


Figure 11. Automatic Water Rack Flush System (For Two Racks) – Option

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
11				**AUTOMATIC WATER RACK FLUSH SYSTEM (FOR TWO RACKS) – OPTION**	**X**
1	P	117954	451	ELBOW, S/S, 90º, 3/4"F x 3/4"F	2
2	P	117956	164	NIPPLE, S/S, 3/4 x 9"	2
3	P	117940	409	ELBOW, S/S, 45º, 3/4"F x 3/4"F	2
4	P	117941	498	BUSHING, Reducing, S/S, 3/4"M x 1/4"F	2
5	P	117940	138	ADAPTOR, Quick Disconnect Removable, S/S, 1/4"F	2
6	P	117901	525	SUPPORT, Piping	2
7	P	117943	312	ADAPTOR, Quick Disconnect Detachable, S/S, 1/4"M	2
8	P	117940	148	HOSE, FLEXIBLE, S/S, 1/4" M x 1/4" M x 60"	2
9	P	117940	137	ADAPTOR, Quick Disconnect Socket, S/S, 1/4"F	1

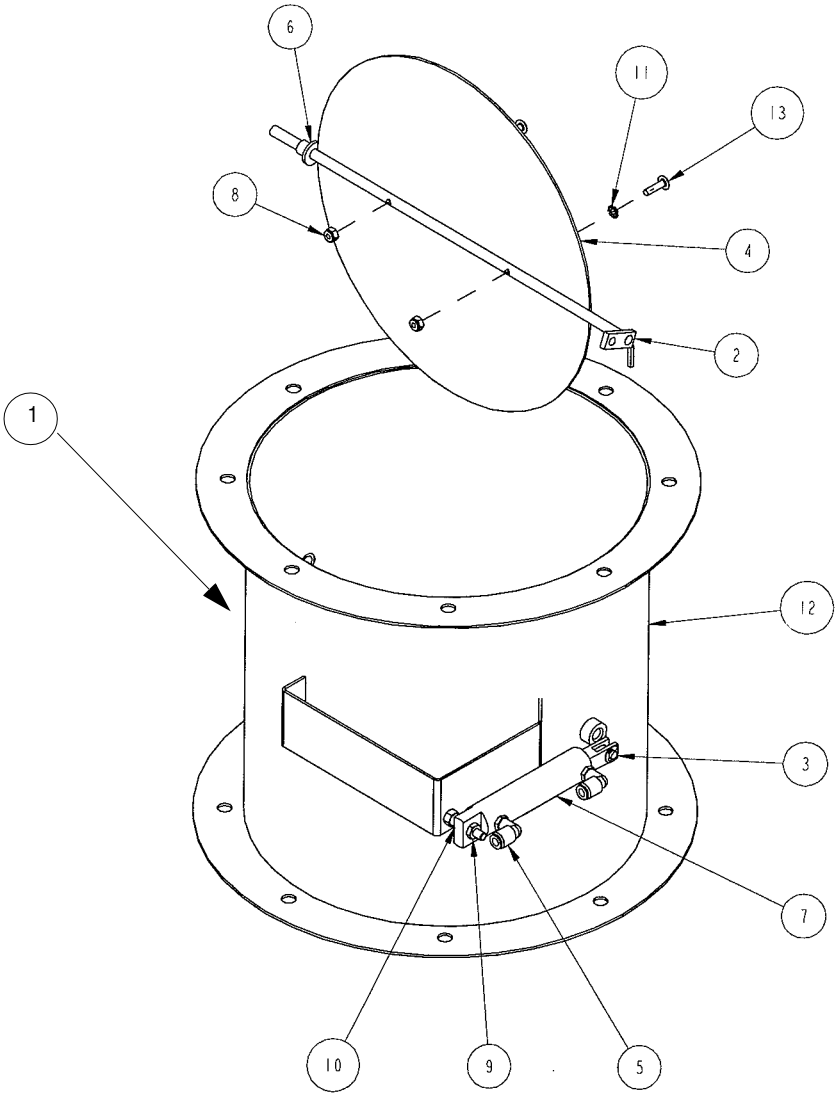


Figure 12. Damper

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
12				**DAMPER**	**X**
1	P	117041	418	DAMPER, Assembly	1
2	P	117041	431	SHAFT, Damper	1
3	P	117902	568	CLEVIS, Cylinder, 3/4"	1
4	P	117041	411	TRAP, Damper	1
5	P	117911	889	ELBOW, Pneumatic, 90°, 10-32 x 1/4" OD	2
6	P	117997	580	BUSHING, Baffle, Exhaust Vent	2
7	P	117911	709	CYLINDER, Pneumatic	1
8	P	117941	365	LOCKNUT, S/S, 10-32 (Nylon Insert)	2
9	P	117904	641	NUT, Jam, S/S, 1/4"-20	1
10	P	117997	581	SPACER, Baffle, Exhaust, Cylinder	1
11	P	117906	017	LOCKWASHER, Star, For Screw #10	2
12	P	117041	417	DAMPER	1
13	P	117950	867	SCREW, Truss Head, S/S,10-32 x 1/2", Nylok	2

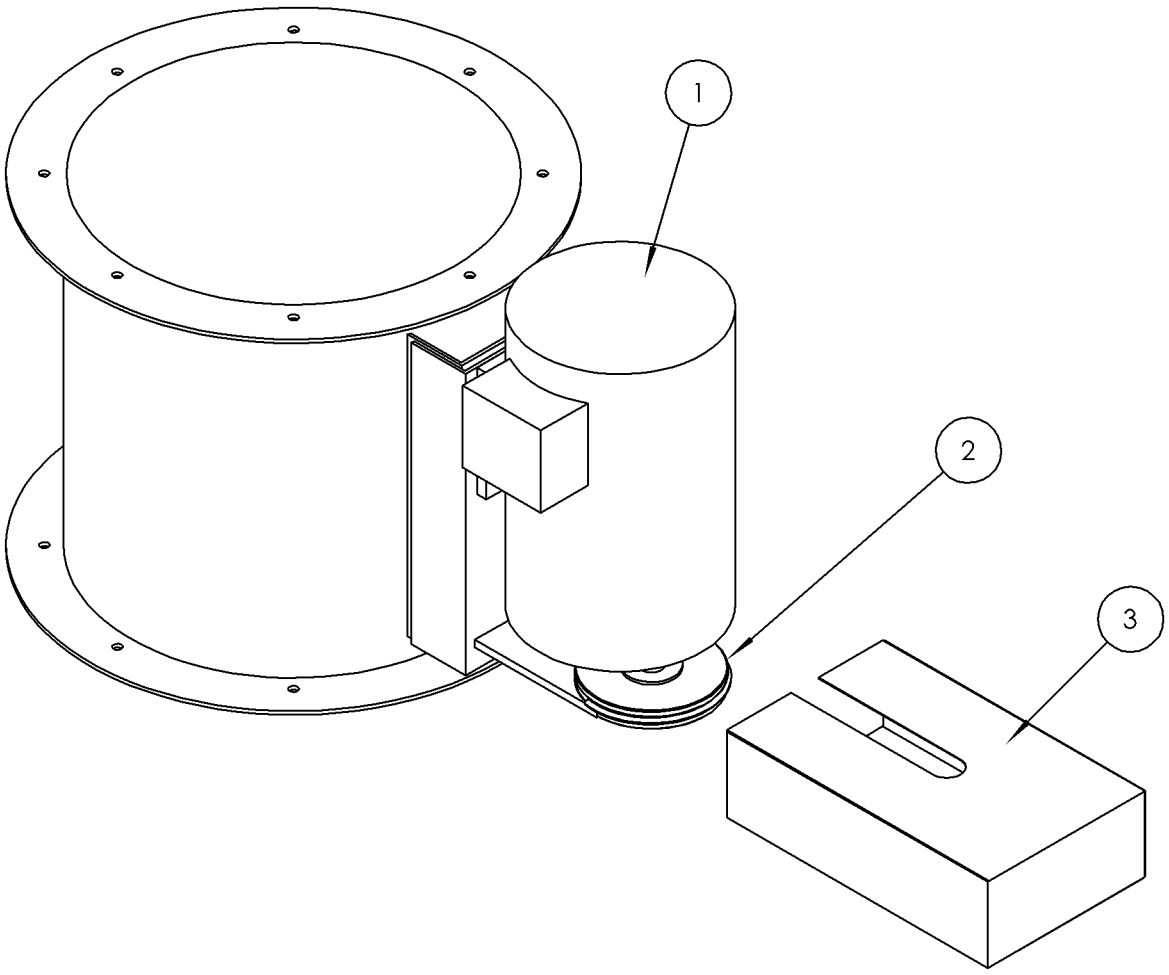


Figure 13. Exhaust Fan

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
13				**EXHAUST FAN**	**X**			
1	P	117940	112	EXHAUST FAN, 1/3 hp.....	1			
2	P	117943	246	BELT.....	2			
3	P	117940	693	COVER, Guard, Belt, Exhaust Fan.....	1			
	P	117951	457	GREASE, Drying Fan, 420 mL (Not Shown)	1			
	P	117907	874	HOSE, Air, 1/4", Nylon (Not Shown).....	A/R			

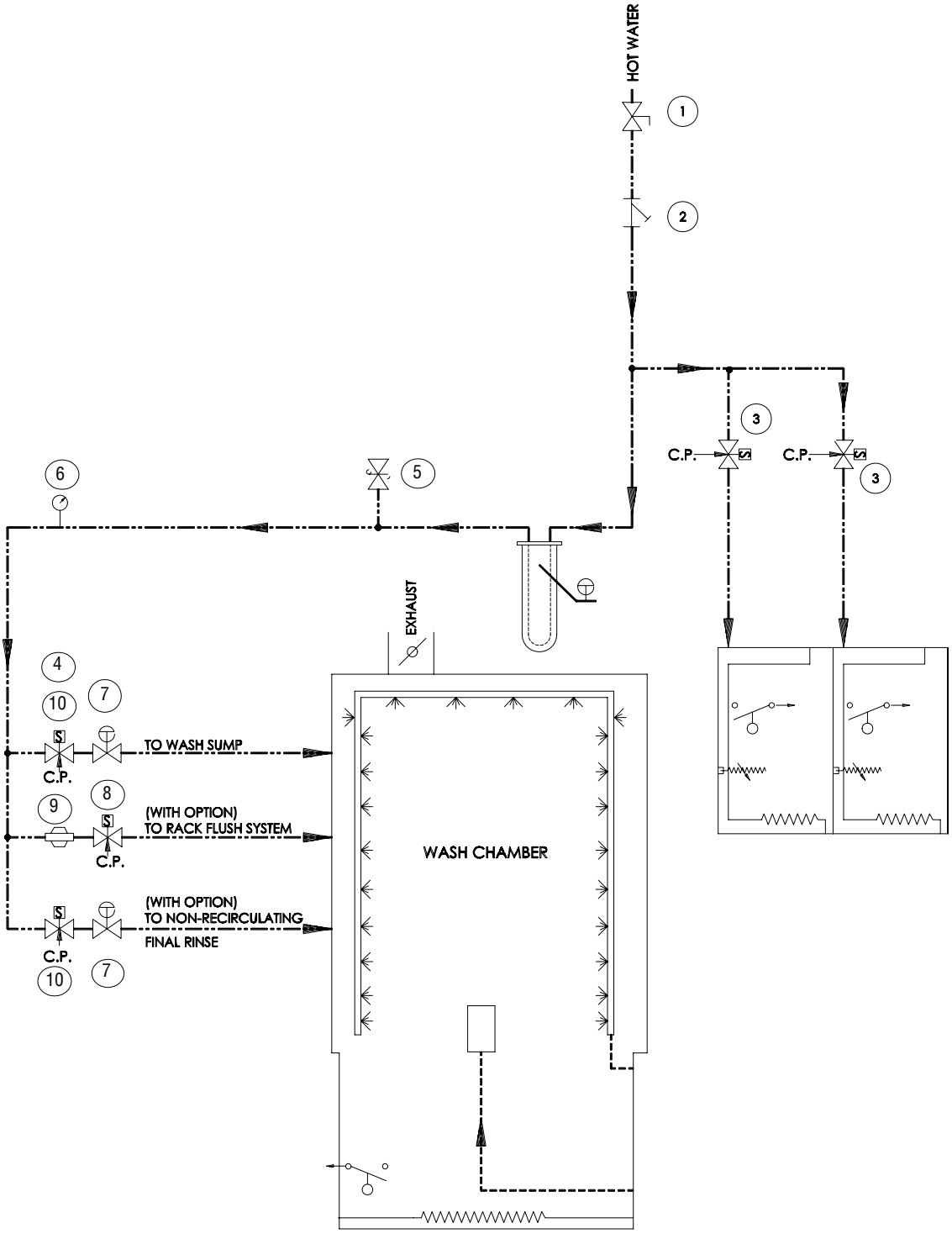


Figure 14. Hot Water Line Components

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
14				**HOT WATER LINE COMPONENTS** **Standard Units**	**X**			
				With Heat Exchanger Option		**X**		
				With Rack Flush System Option			**X**	
				With Non Recirculating Final Rinse Option				**X**
1	P	117941	001	VALVE, Ball, Manual, Brass,1"F	1			
2	P	117950	205	STRAINER, Bronze,1"F, Water, Mesh 80	1			
3	P	117904	297	VALVE, Water, 3/4", Copper	2			
	P	117955	186	• COIL, Replacement, 117-904-297				
4	P	117903	825	VALVE, Water, 1"	1			1
	P	117950	212	• KIT, Repair, for Valve 117-903-825 (Not Shown)	1			1
	P	117915	003	• COIL, #CS238-812-032 for Valve 117-903-825				
5	P	117940	074	VALVE, Pressure Relief, 3/4" NPT, 125 psi		1		
6	P	117940	122	THERMOMETER, 0-250°F		1		
7	P	117950	220	VALVE, Globe, 1"	1			1
8	P	117956	361	VALVE, Solenoid, 3/4", Steam			1	
	P	117951	286	• KIT, Repair, for Valve 117956-361			1	
9	P	117940	084	REGULATOR, Water, 3/4"NPT			1	
10	P	117903	823	VALVE, Steam, Copper, 1"		1		
	P	117951	000	• KIT, Repair, for valve 117-903-823 (Not Shown)		1		
	P	117955	189	• COIL, For Valve 117-903-823 (Not Shown)		1		

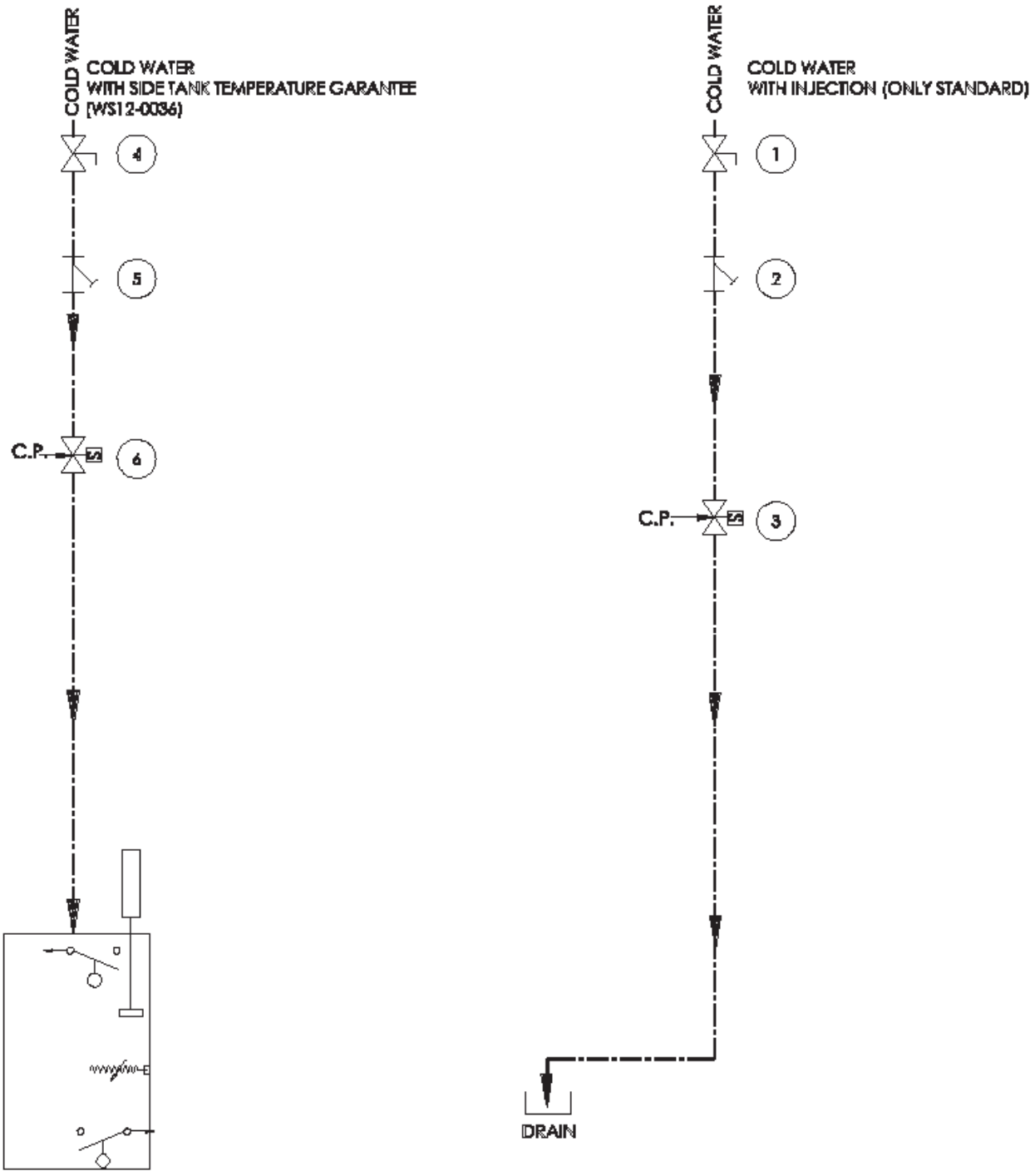


Figure 15. Cold Water Line Components

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
15				**COLD WATER LINE COMPONENTS** **Standard Units**	**X**			
				With Temperature Guaranteed		**X**		
1	P	117940	025	VALVE, Ball,1-1/2"NPT, Brass	1			
2	P	117942	897	STRAINER, Bonze, 1-1/2"NPT	1			
3	P	117910	055	VALVE, Water, Brass, 1-1/2" NPT	1			
	P	117943	569	• KIT, Repair for Valve 117-910-055				
4	P	117941	001	VALVE, Ball, Brass, 1"F		1		
5	P	117950	205	STRAINER, Bronze, 1"F, Water, Mesh 80		1		
6	P	117903	825	VALVE, Water, 1"		1		
	P	117950	212	• KIT, Repair for Valve 117-903-825 (Not Shown)		1		
	P	117915	003	• COIL, #CS238-812-032 for 117-903-825				

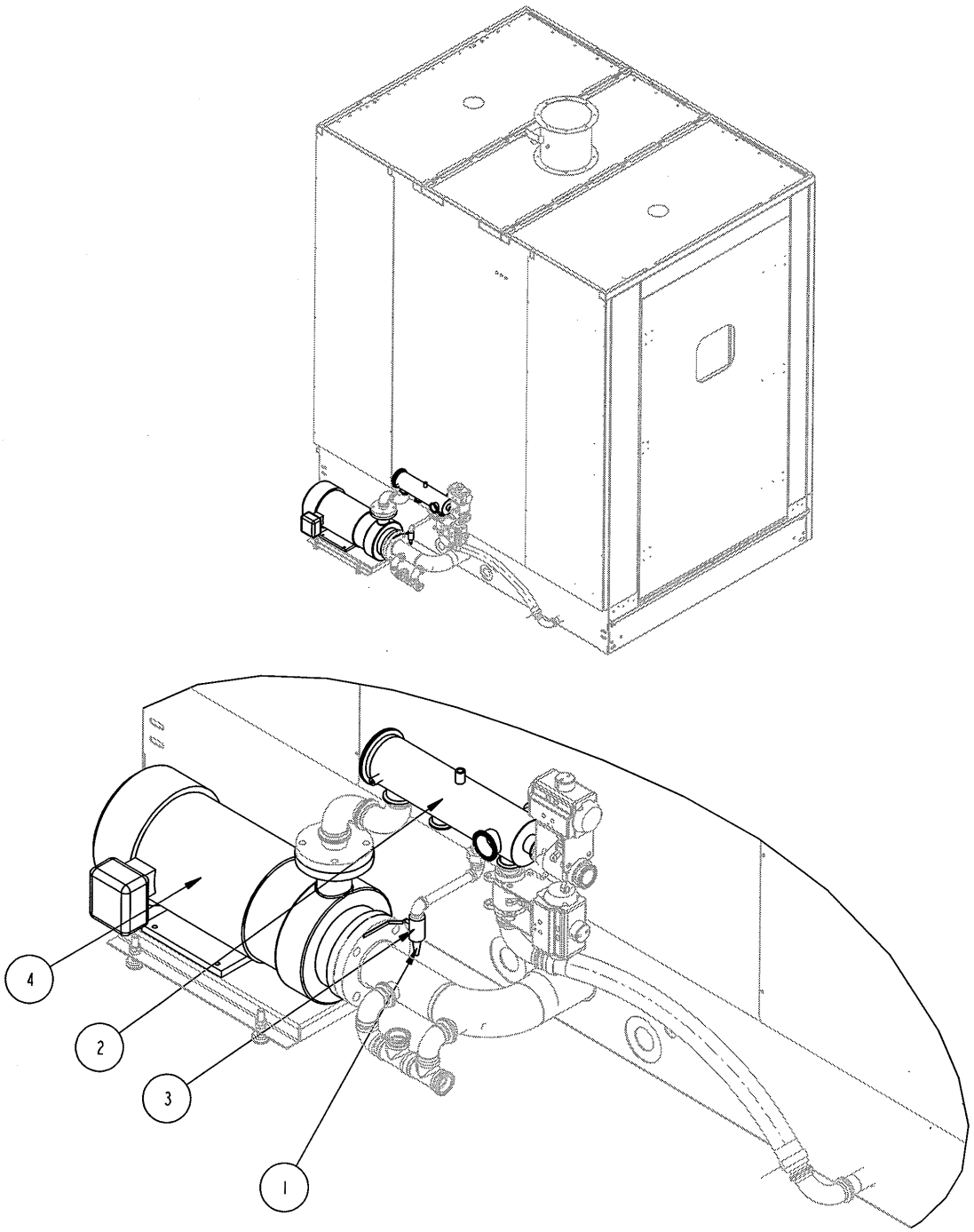


Figure 16. Recirculation Piping

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
16				**RECIRCULATION PIPING**	**X**			
1	P	117010	270	NOZZLE, Valve, Sampling	1			
2	P	117044	493	HOUSING, Filter, Self-Cleaning	1			
	P	117041	836	SELF-CLEANING FILTER	1			
3	P	117943	286	BALL VALVE, Manual, S/S, 3/8"F	1			
4	P	117943	319	PUMP, 10hp, 208/230/460V, D824F, 9H, WORTH	1			
	P	117943	550	• SEAL, Pump Shaft, 10-15hp D-824				

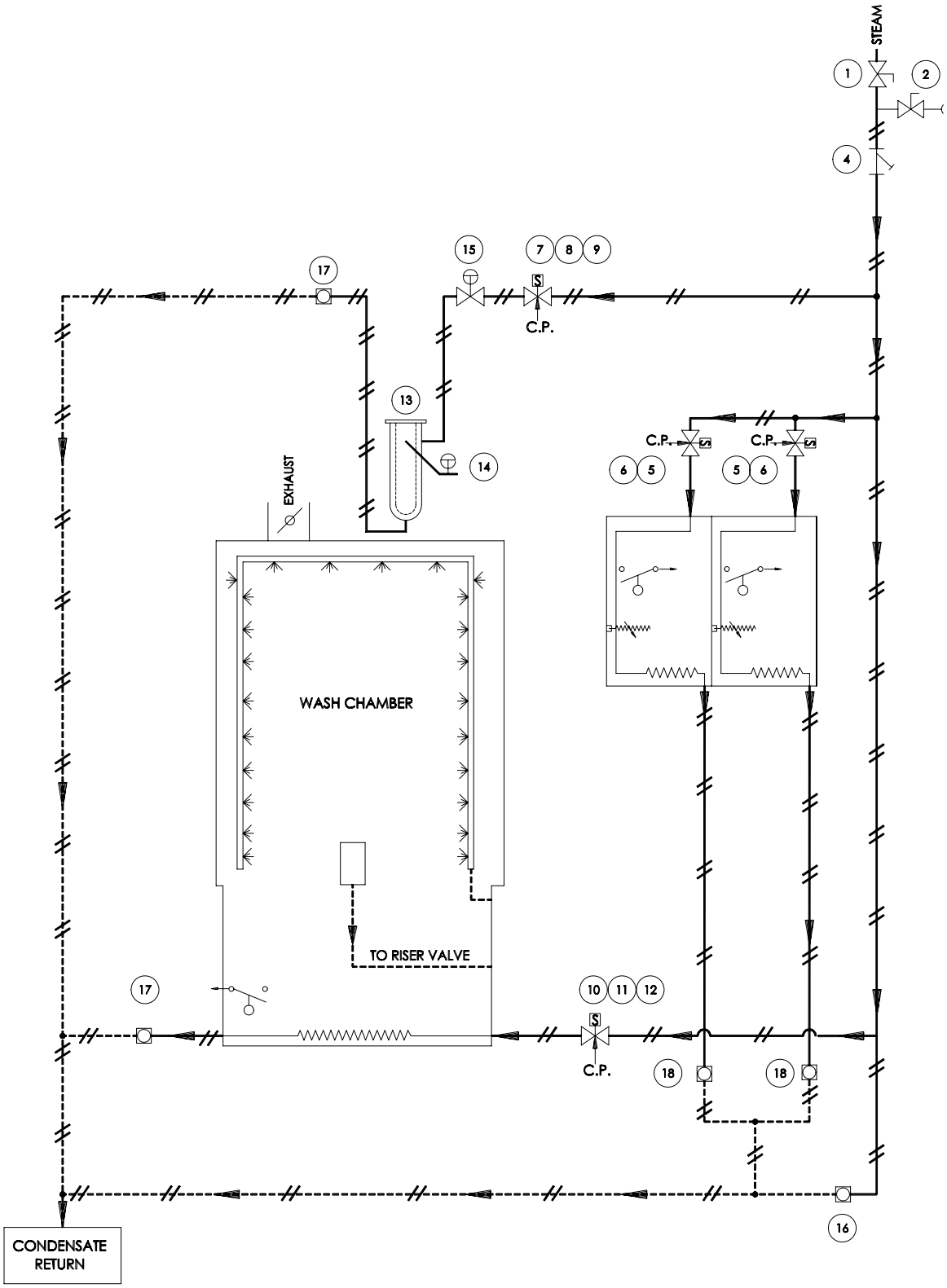


Figure 17. Steam Line Components

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
17				**STEAM LINE COMPONENTS** **Standard Units**	**X**			
				With Acid Tank Option		**X**		
				With Heat Exchanger Option			**X**	
1	P	117940	025	VALVE, Ball, 1-1/2" NPT, Brass	1	1		
2	P	117940	083	VALVE, Ball, Manual, Brass, 1/4" F	1	1		
3	P	117959	340	PRESSURE GAUGE, 0-100 PSIG, 1/4"NPT (Not Shown)	1	1		
4	P	117950	192	STRAINER, Bronze, 1-1/2"F, STEAM	1	1		
5	P	117956	361	VALVE, Steam, Copper, 3/4"	1	2		
6	P	117951	286	• KIT, Repair, For Valve 117-956-361		1	2	
7	P	117903	824	VALVE, Steam, Copper, 1-1/2"			1	
8	P	117950	998	• KIT, Repair, For Valve 117-903-824			1	
9	P	117950	480	• COIL, for Valve 117-903-824			1	
10	P	117903	823	VALVE, Steam, Copper, 1"	1	1		
11	P	117951	000	• KIT, Repair, For Valve 117-903-823	1	1		
12	P	117955	189	• COIL, For Valve 117-903-823	1	1		
13	P	117940	121	HEAT EXCHANGER, Sump Fill, Vertical Mount			1	
14	P	117940	073	BREAKER, Vacuum, 1/2", Brass			1	
15	P	117940	075	VALVE, Globe,1-1/2" NPT, Bronze			1	
16	P	117950	182	TRAP, Steam, 1/2"	1			
17	P	117950	198	TRAP, Steam, 1"	1		2	
18	P	117950	360	TRAP, Steam, 3/4"	1	2		

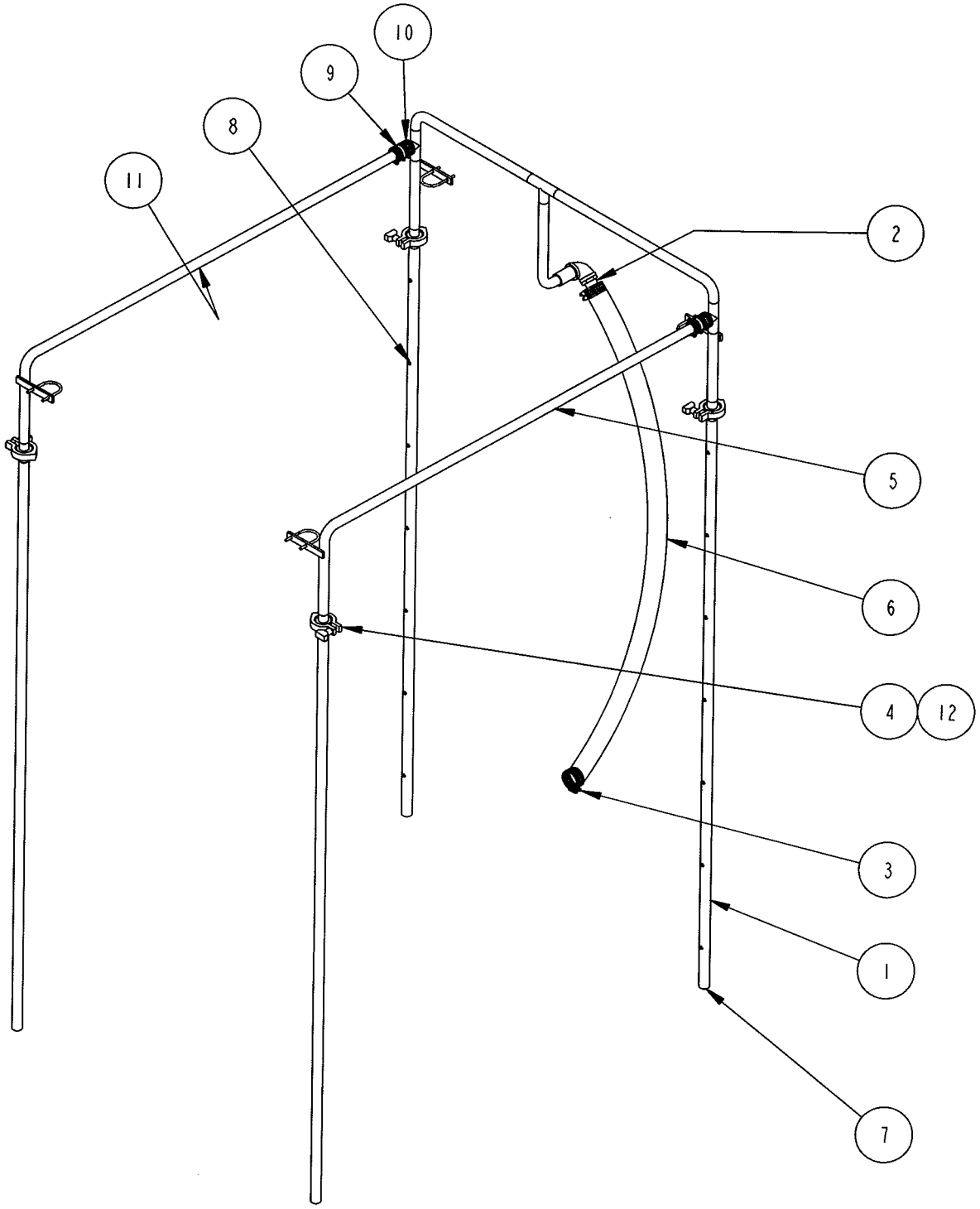


Figure 18. Final Rinse System Assembly

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
18				**FINAL RINSE SYSTEM ASSEMBLY – OPTION**	**X**
1	P	117044	375	SPRAY, Arm, Final Rinse Without Pan Cart	4
2	P	117915	234	ADAPTOR, S/S, 1"NPT x 1"BARB 316	1
3	P	117950	674	CLAMP, S/S, #24, 1-1/16" x 2"	4
4	P	117951	196	CLAMP, Quick Disconnect, S/S, 1/2"	4
5	P	117994	096	SPRAY HEADER, Non-Recirculated Final Rinse	1
6	P	117909	599	HOSE, Rubber, Flexible, 1" x 12"	1
7	P	117952	208	PLUG, S/S, 3/4"F	4
8	P	117940	052	JET,1/4" S/S	28
9	P	117950	689	HOSE, 1" x 2-1/4" Black	2
10	P	117950	787	CLAMP, S/S #16 11/16" x 1-1/2	6
11	P	117915	193	SPRAY JET, S/S, 1/8"US	4
12	P	117955	533	GASKET, Silicone, 1"	4

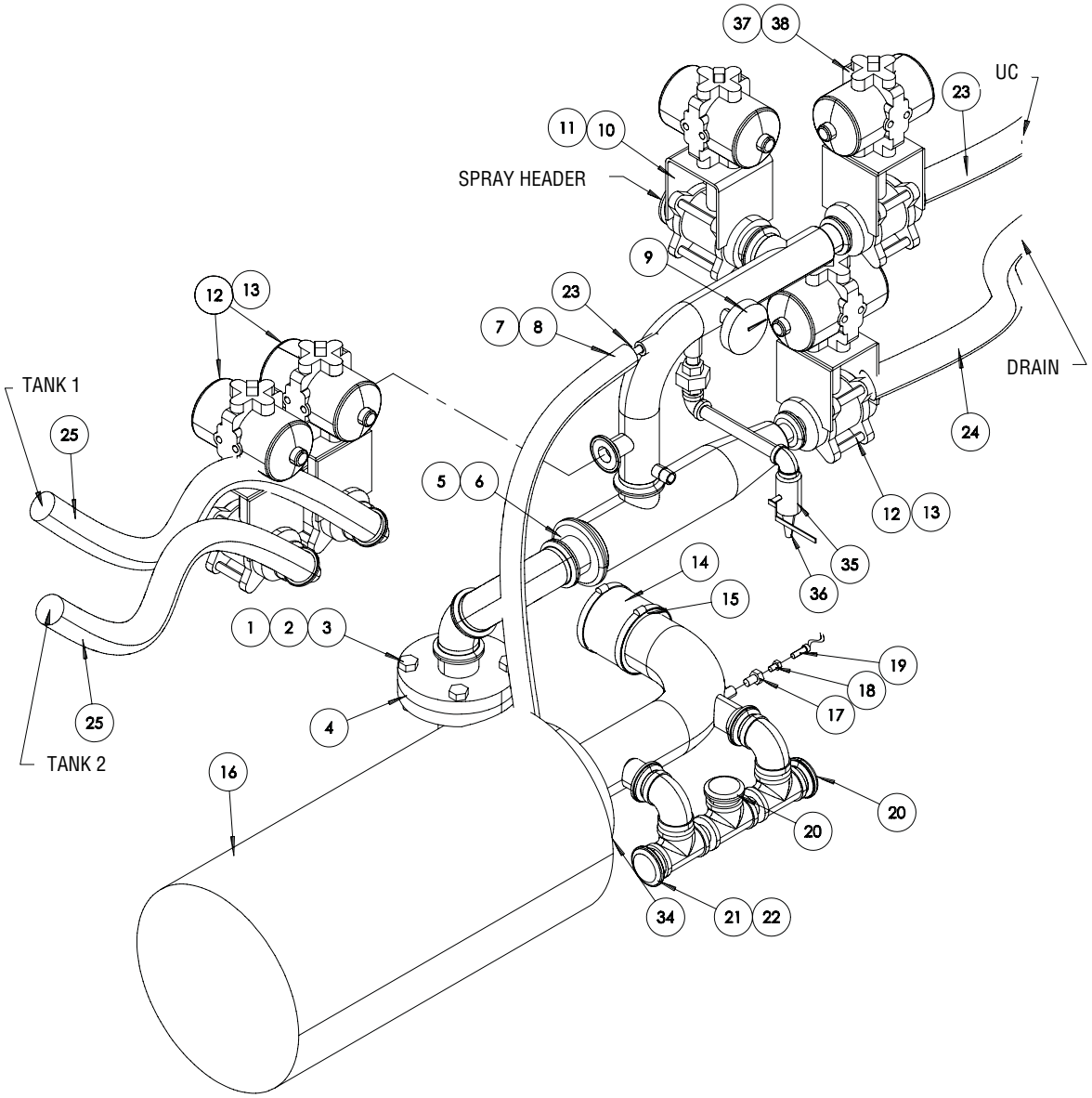


Figure 19. Recirculation Pump System and Self-Cleaning Filter

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
19				**RECIRCULATION PUMP SYSTEM AND SELF-CLEANING FILTER** **One Tank**	**X**			
				Two Tanks		**X**		
1	P	117940	999	BOLT, Steel, 5/8"-11 x 2-1/2", Plated	4	8		
2	P	117940	702	LOCKWASHER, Steel, 5/8", Plated	4	8		
3	P	117940	701	NUT, Steel, 5/"8-11, Plated	4			
4	P	117940	019	GASKET, Teflon, 2" Ø	1			
5	P	117041	836	FILTER, Self-Cleaning	1			
6	P	117044	493	CARTRIDGE, Filter, Self-cleaning	1			
7	P	117940	292	HOSE, 1/2"	30"			
8	P	117950	674	CLAMP, S/S, #24, 1-1/16" @ 2"	4			
9	P	117940	020	PRESSURE GAUGE, 0-60 PSI, 1/4"	1			
10	P	117997	591	VALVE, Pneumatic, Ball, 2"	1			
11	P	117942	756	• KIT, Repair, For Valve 117997-591	1			
12	P	117909	604	VALVE, Pneumatic, Ball, 1"	3	4		
13	P	117943	208	• KIT, Repair, For Valve 117909-604	3	4		
14	P	117941	438	HOSE, 3-1/2 x 4"	1			
15	P	117950	792	CLAMP, S/S, #64, 3-9/16" @ 4-1/2"	4			
16	P	117943	319	PUMP, 10hp 208/230/460V D824F 9H WORTH (See Figure 16)	1			
17	P	117955	591	FITTING, Compression, S/S, 1/8" M X 1/8 OD	1			
18	P	117909	491	PLUG, S/S, 1/8" M, Hexagonal Head	1			
19	P	117940	805	RTD	1			
20	P	117953	969	CAP, 1-1/2"	1	2		
21	P	117913	069	SENSOR, Conductivity, 200 pH	1			
22	P	117912	269	CABLE, Sensor, Thornton, 10'	1			
23	P	117041	949	HOSE, Pop Up	1			
24	P	117044	130	HOSE, Drain, Flexible	1			
25	P	117041	924	HOSE, Flexible, Tank 1 & 2	1	2		
26	P	117951	387	CLAMP, Quick-Disconnect, 3" (Not Shown)	A/R			
27	P	117953	306	O-RING, Tri-Clamp, 1/2", Silicone (Not Shown)	A/R			
28	P	117950	808	CLAMP, Quick-Disconnect, 2" (Not Shown)	A/R			
29	P	117951	568	GASKET, Silicone, 2" (Not Shown)	A/R			
30	P	117951	196	CLAMP, Quick-Disconnect, 1-1/2" (Not Shown)	A/R			
31	P	117953	306	GASKET, Silicone, 1-1/2" (Not Shown)	A/R			
32	P	117906	173	SOLUTION, Conductivity, 84 uS/cm (Not Shown)	1			
33	P	117906	175	SOLUTION, Conductivity, 5000 uS/cm (Not Shown)	1			
34	P	117940	018	GASKET, Teflon, 3" Ø	1			
35	P	117943	286	VALVE, Ball, Man., S/S, 3/8"	1			
36	P	117010	270	NOZZLE, Valve, Sampling	1			
37	P	117997	590	VALVE, Pneumatic Ball, Assembly, 1-1/2"	1			
38	P	117912	699	KIT, Repair, RKP154 for Actuator	1			
	P	117943	209	• KIT, Repair, #RKN111TT for Valve 1-1/2"				

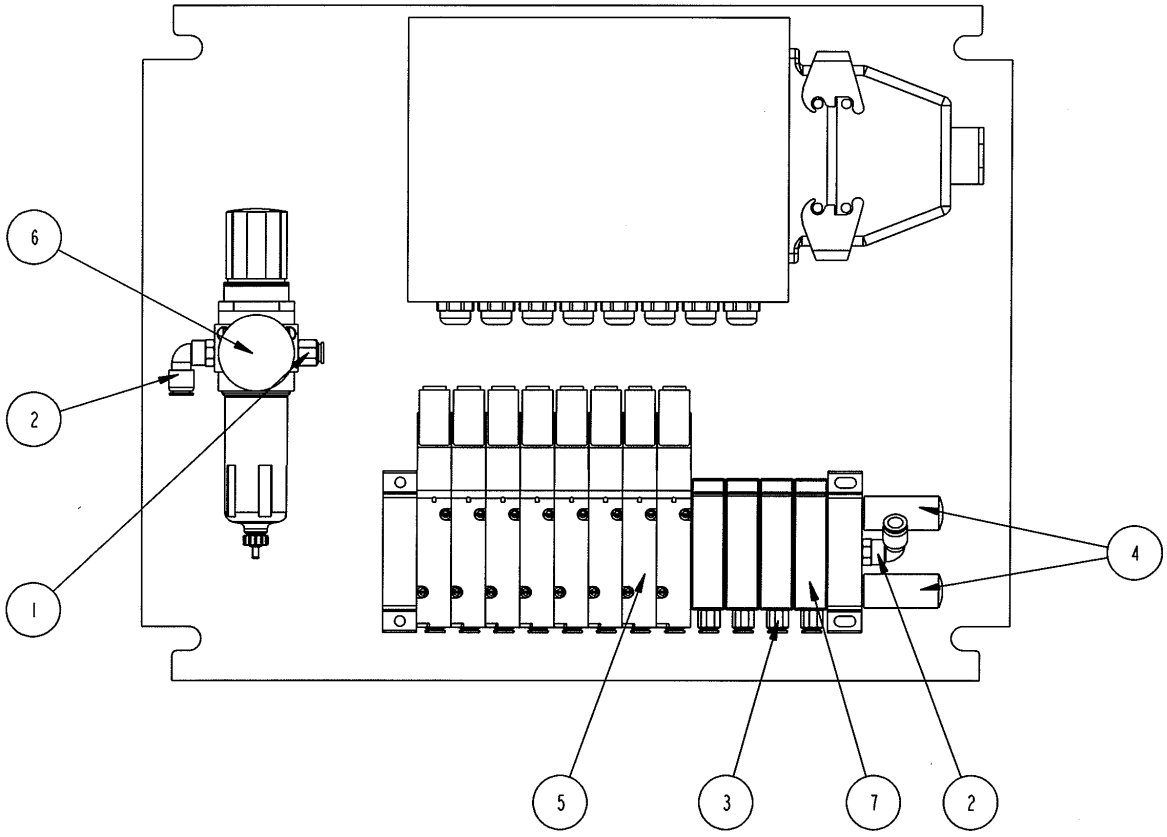


Figure 20. Pneumatic Block

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
20				**PNEUMATIC BLOCK**	**X**
	P	117915	009	PNEUMATIC BLOCK	
1	P	117916	897	STRAIGHT CONNECTOR, QS-H-1/4-3/8-U-M	1
2	P	117916	898	90º CONNECTOR, QSL-H-1/4-3/8-U-M	2
3	P	117916	445	STRAIGHT CONNECTOR, QS-H-1/8-1/4-U-M	24
4	P	117912	177	SILENCER, Valve, Pneumatic, U-1/4"	2
5	P	117915	010	VALVE, Pneumatic, 5/2, 110V, Festo	8
6	P	117915	078	FILTER, Regulator, Festo	1
7	P	117915	640	PLATE, Blanking, For Spare Positions	12
	P	117955	228	HOSE, Red, 1/4" OD (Not Shown)	A/R
	P	117955	229	HOSE, Blue, 1/4" OD (Not Shown)	A/R

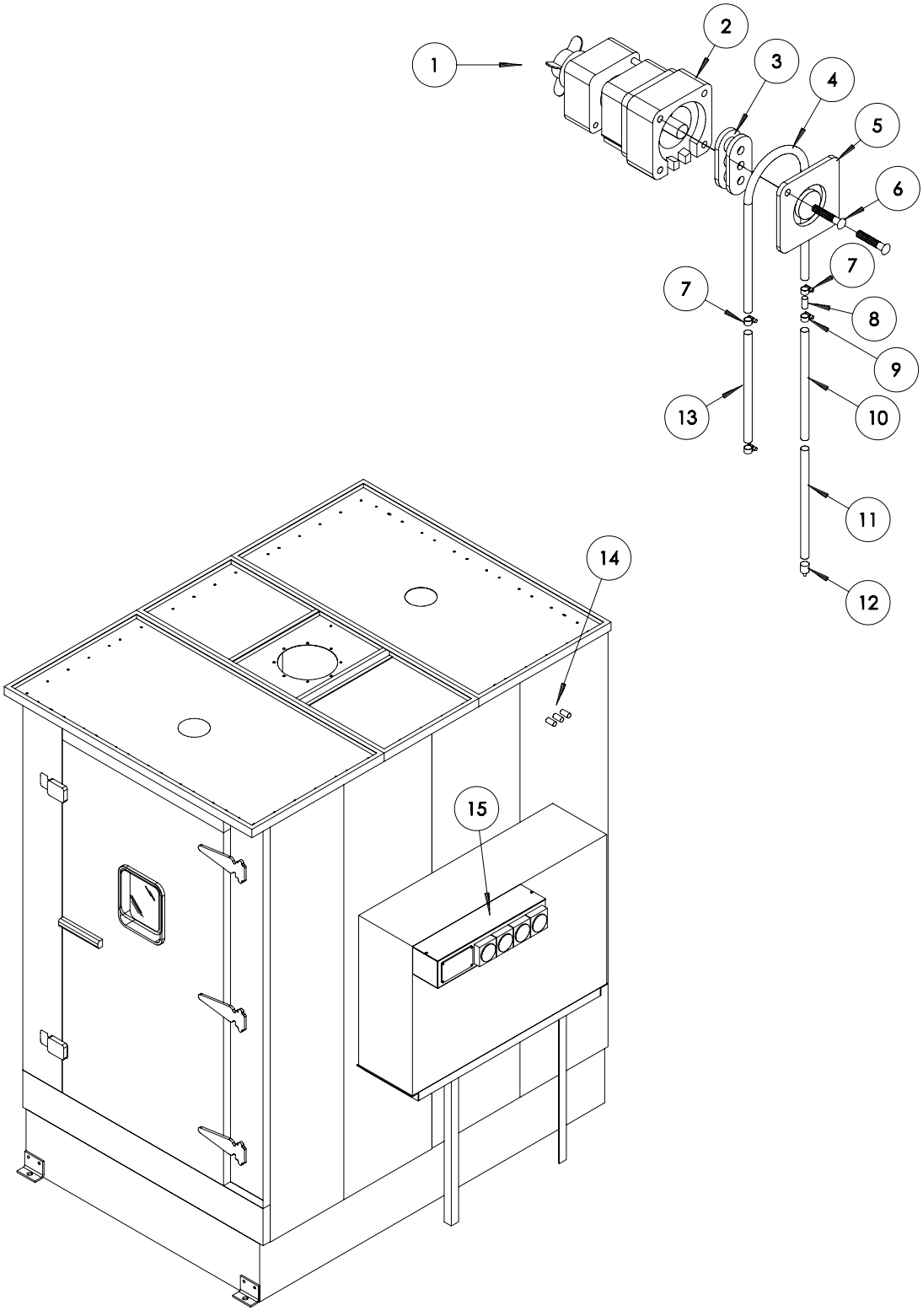


Figure 21. Peristaltic Chemical Injection Pumps

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
21				**PERISTALTIC CHEMICAL INJECTION PUMPS** **Standard Units** ..... **With pH Neutralization**	**X**	**X**		
1	P	117905	727	PUMP, Peristaltic	3	4		
2	P	117950	602	HEAD, Pump, Peristaltic, Large	3	4		
3	P	117950	601	BLOCK, Roller	3	4		
4	P	117950	583	HOSE, C-Flex, 3/8 x 14"	3	4		
5	P	117950	600	COVER, Pump, Peristaltic, Large	3	4		
6	P	117950	858	SCREW, S/S, Truss Head, 8-32 X 3/4"	12	16		
7	P	117912	448	NYLON, Clamp, Double Snap-Grip, 1/2-5/8"	6	8		
8	P	117959	212	BUSHING, S/S, Detergent Inlet	3	4		
9	P	117950	783	CLAMP, S/S, #4, 1/4" @ 5/8"	6	8		
10	P	117906	873	HOSE, 3/8" x 50', Polyethylene	3	4		
11	P	117957	953	TUBE, Pick-Up, 38"	3	4		
12	P	117908	973	FOOT VALVE, Small, For Polyflo Tube, 3/8"	3	4		
13	P	117952	302	HOSE, Reinforced Vinyl, 3/8"	3	4		
14	P	117940	274	EXTENSION, Detergent Injection	3	4		
15	P	117044	103	BOX, Detergent Pump	1	1		

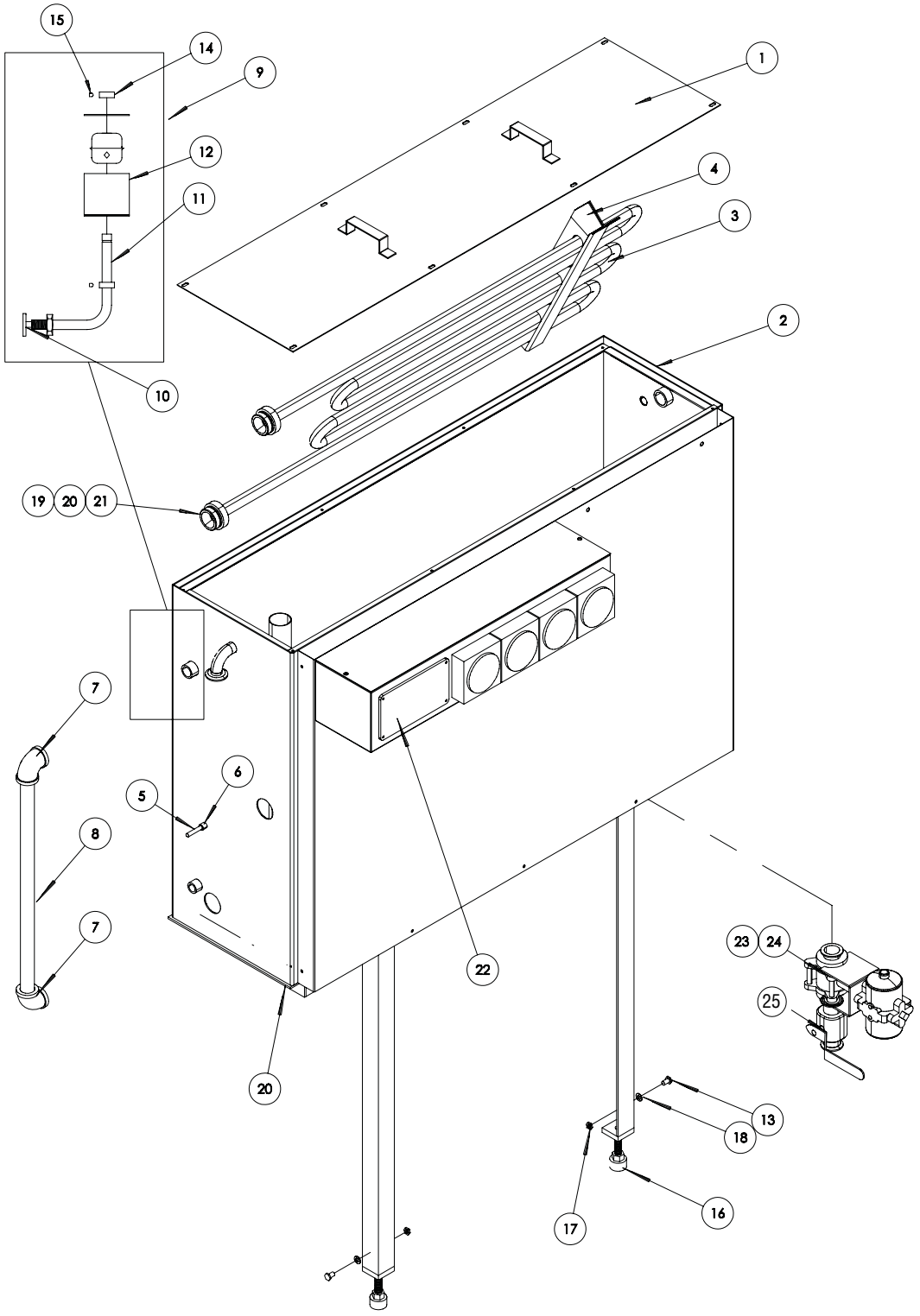


Figure 22. Solution Tank

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
22				**SOLUTION TANK** **Standard Units**	**X**			
				With Reusable Throw-Away Option		**X**		
1	P	117940	290	COVER, Tank	1	2		
2	P	117041	338	TANK	1	2		
3	P	117041	216	COIL, Tank	1	2		
4	P	117042	038	SUPPORT, Coil	1	2		
5	P	117940	805	RTD	1	2		
	P	117909	491	PLUG, S/S, 1/8" M, Hexagonal Head	1	2		
6	P	117955	591	FITTING, Compression, S/S, 1/8" M x 1/8" OD	1	2		
7	P	117940	039	ELBOW, Male	2	4		
8	P	117940	040	TUBE, Glass, 5/8" X 24"	1	2		
9	P	117905	655	SENSOR, Water Level, With Cover	1	2		
10	P	117902	479	GASKET, Sensor, Water Level	1	2		
11	P	117902	408	CONTROL, Level	1	2		
12	P	117902	275	COVER, Protection, Sensor, Water Level	1	2		
13	P	117950	905	BOLT, S/S, 5/16"-18 x 3/4"	2	2		
14	P	117906	995	COLLAR, Sensor, Water Level	2	4		
15	P	117906	374	SCREW, S/S, 316L, Socket, 6-32 x 1/8" Cup	2	4		
16	P	117940	260	ADJUSTABLE LEG	2	2		
17	P	117950	954	NUT, S/S, 5/16-18	6	6		
18	P	117950	977	WASHER, S/S, 5/16"	6	9		
19	P	117903	787	NUT, Steam Coil	2	4		
20	P	117903	786	GASKET, Steam Coil, Teflon	2	4		
21	P	117903	785	GASKET, Steam Coil, Viton	2	4		
22	P	117912	459	ANALYSER, Conductivity, Thornton 2000	1	1		
23	P	117997	590	VALVE, Pneumatic Ball, 1-1/2"	1	2		
24	P	117943	209	• KIT, Repair, For Valve 117997-590	1	2		
25	P	117041	746	VALVE, Ball, 1-1/2", Tri-Clamp, S/S	1	2		

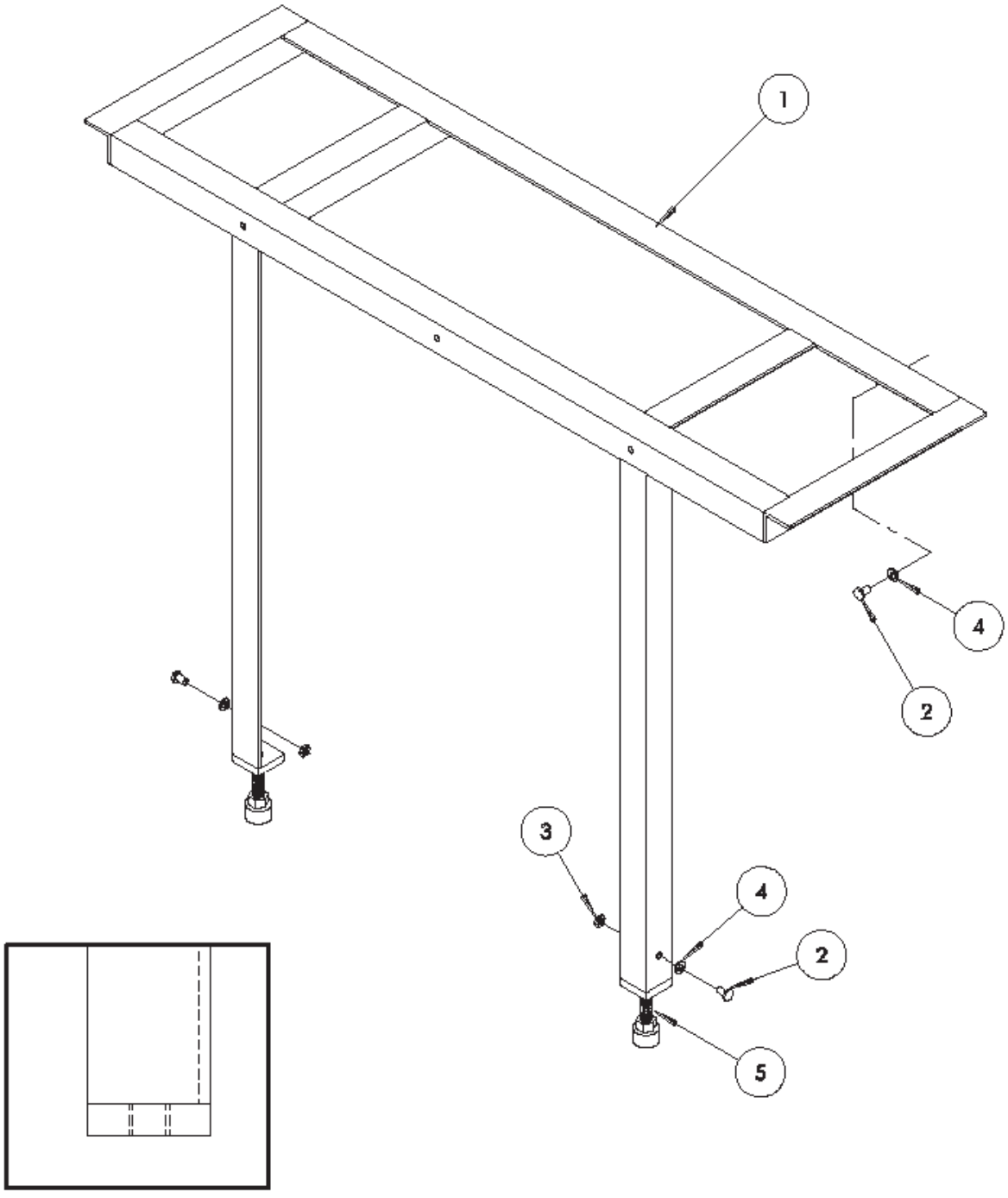


Figure 23. Tank Support Frame

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
23				**TANK SUPPORT FRAME**	**X**
1	P	117941	160	SUPPORT, Tank Assembly	1
2	P	117950	905	BOLT, S/S, 5/16"-18 x 3/4"	6
3	P	117950	954	NUT, S/S, 5/16"-18	2
4	P	117950	977	WASHER, S/S, 5/16"	6
5	P	117940	260	LEG, Adjustable	2

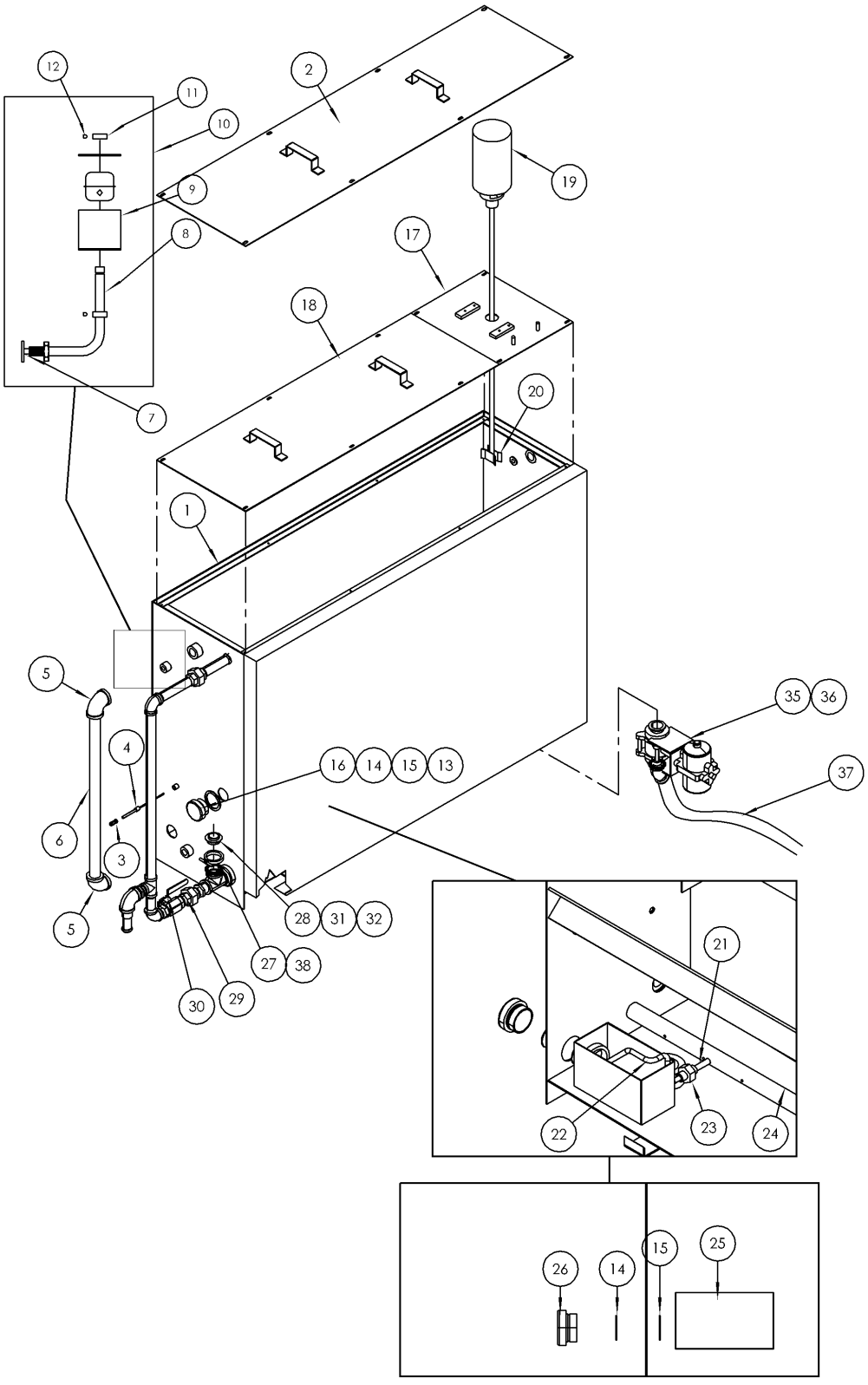


Figure 24. Guaranteed Cooldown Tank

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
24				**GUARANTEED COOLDOWN TANK** **Without pH Neutralization** **With pH Neutralization**	**X**	**X**		
1	P	117041	338	TANK	1	1		
2	P	117940	290	COVER, Tank	1	-		
3	P	117955	591	FITTING, Compression, S/S, 1/8" M x 1/8" OD	1	1		
4	P	117955	383	RTD, Single Element,100 ohm, With Connector	1	1		
5	P	117940	039	ELBOW, Male	2	2		
6	P	117940	040	TUBE, Glass 5/8" x 24"	1	1		
7	P	117902	479	GASKET, Sensor	1	1		
8	P	117902	408	CONTROL, Level	1	1		
9	P	117902	275	COVER, Protection, Sensor, Water Level	1	1		
10	P	117905	655	SENSOR, Water Level, With Cover	1	1		
11	P	117906	995	COLLAR, Sensor, Water Level	2	2		
12	P	117906	374	SCREW, S/S, 316L, Socket, 6-32 X 1/8" Cup	2	2		
13	P	117903	787	NUT, Steam Coil	2	2		
14	P	117903	786	GASKET, Steam Coil, Teflon	2	2		
15	P	117903	785	GASKET, Steam Coil, Viton	2	2		
16	P	117041	923	PLUG, Coupling, Steam Coil	2	2		
17	P	117001	203	COVER, Tank, Short, Agitator		1		
18	P	117001	192	COVER, Tank, Upper		1		
19	P	117940	151	MIXER, 1/3 hp		1		
20	P	117993	411	PROPELLER, Mixer		1		
21	P	117941	456	NIPPLE, S/S, 1/8 x 2"		1		
22	P	117992	953	TUBE, pH Probe		1		
23	P	117941	475	UNION, S/S, 1/8" F		1		
24	P	117940	284	SPRAY ARM, Cooldown		1		
25	P	117993	700	TANK, pH probe		1		
26	P	117993	699	COUPLING, Modified For pH		1		
27	P	117951	196	CLAMP, Quick-Disconnect, 1-1/2"	A/R	A/R		
28	P	117992	946	ADAPTOR, pH Probe		1		
29	P	117043	204	PIPING, pH, For Cooldown Tank		1		
30	P	117914	331	VALVE, BALL, 3/4"F		1		
31	P	117909	559	SENSOR, pH, For Thornton Controller, 200 pH		1		
32	P	117913	070	CORD, Patch, Thornton , 10'		1		
33				-- Not Used --				
34				-- Not Used --				
35	P	117997	590	VALVE, Pneumatic, Ball, 1-1/2"	1	1		
36	P	117943	209	• KIT, Repair, For Valve 117997-590	1	1		
37	P	117041	946	HOSE, Flexible, Drain, Tank 3	1	1		
38	P	117953	306	GASKET, Silicone, 1-1/2"	A/R	A/R		
	P	117903	080	SOLUTION, pH 4.00, 500 mL (Not Shown)		1		
	P	117908	381	SOLUTION, pH 10.00, 500 mL (Not Shown)		1		

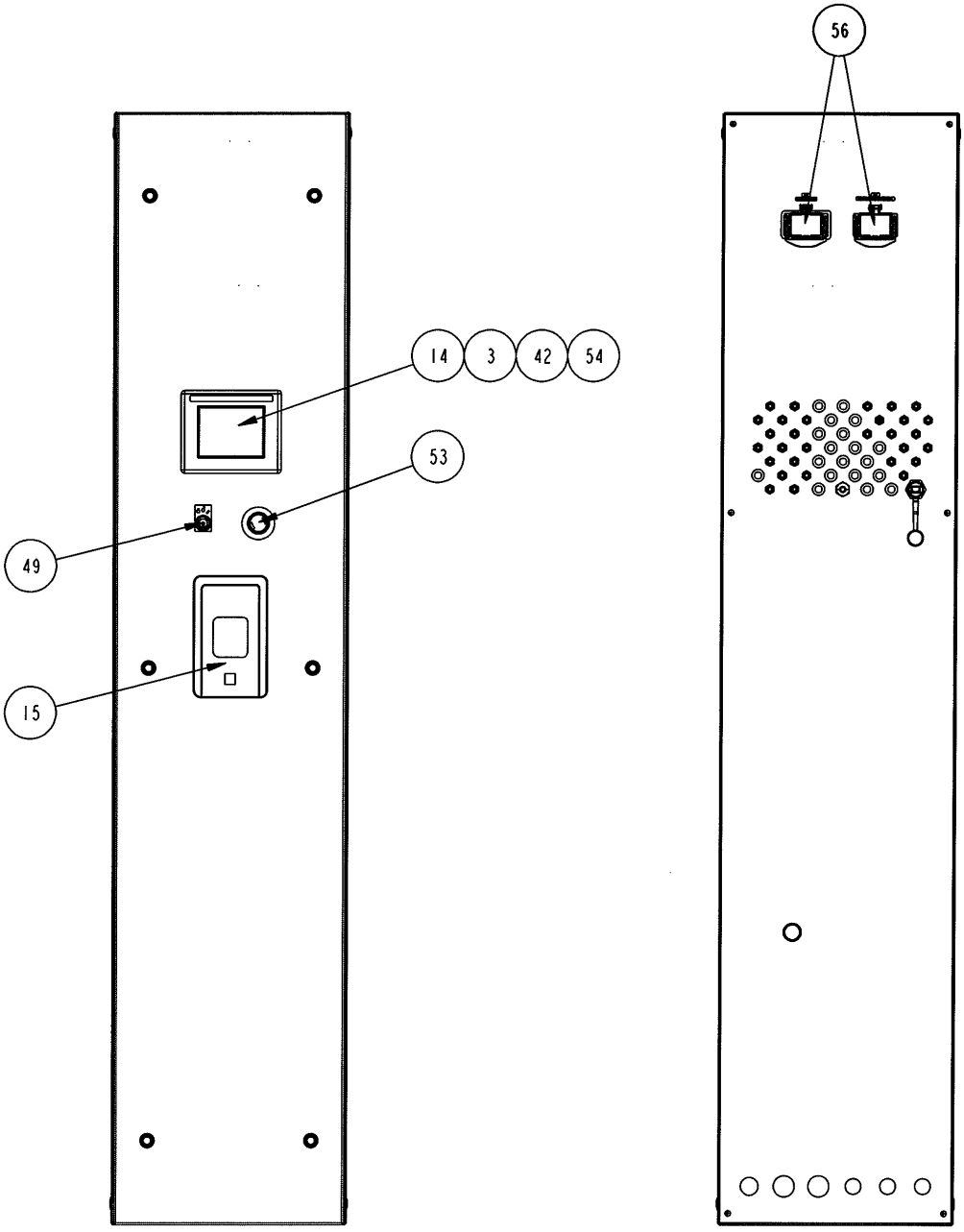


Figure 25a. Electrical Box and Control Column Assembly

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
25a				**ELECTRICAL BOX AND CONTROL COLUMN ASSEMBLY .....**	**X**
1	P	117015	881	CONNECTOR, Ground (see Detail A)	4
2	P	117031	428	ANALOG OUTPUT MODULE, 8 PTS, COMPACTLOGIX	1
3	P	117031	430	INNER-PLATE, Down, Control Box	1
4	P	117033	732	FUSE, 30A, 600V, LITTELFUSE	3
5	P	117042	320	POWER SUPPLY, 24V, 10A, SIEMENS	1
6	P	117042	334	BREAKER, 1P, 5A, SCHURTER	1
7	P	117043	343	RELAY, Safety, 4NO-2NC, OMRON (see Detail B)	3
8	P	117043	344	BASE, Safety Relay, OMRON (see Detail B)	3
9	P	117050	166	PROGRAMMABLE CONTROLER, COMPACTLOGIX A-B	1
10	P	117050	177	MODULE, 6 Inputs, RTD/Tank,1769-IR6 A-B	1
11	P	117050	226	END CAP LEFT TERMINATION MODULE	1
12	P	117050	230	POWER SUPPLY, 1769-PA2 A-B	2
13	P	117050	231	END CAP RIGHT TERMINATION MODULE	2
14	P	117050	347	SCREEN, 2711P-T6C20A A-B	1
15	P	117051	412	PRINTER, Impact	1
16	P	117902	672	FUSE, CC Class, 10A, 600V	3
17	P	117903	070	FUSE, 6 A, 600V, CC Class	2
18	P	117907	539	DIODE, 1N4004 (see Detail B)	3
19	P	117908	128	ALARM, Audible, 95 dB, 120V	1
20	P	117909	743	FUSE, 8A, 250V, LITTELFUSE (see Detail B)	2
21	P	117909	751	HOLDER, Fuse, 3P, 30A, 600V	1
22	P	117909	787	TERMINAL, M16/12.N #125129.16 ENTRELEC (see Detail C)	1
23	P	117909	788	TERMINAL, M16/12 #115129.14 ENTRELEC (see Detail C)	6
24	P	117909	792	HUB CAP, FEM12 #118618.01 ENTRELEC (see Detail C)	3
25	P	117909	794	HUB CAP, FEM13U #199635.24 ENTRELEC (see Detail B)	1
26	P	117909	796	HOLDER, Fuse, ML10/13.SF (see Detail B)	7
27	P	117909	799	BAR, Jumper, BJM12 #179618.16 ENTRELEC (see Detail C)	3
28	P	117910	455	RELAY, DPDT #LY2-AC120 OMRON (see Detail A)	1
29	P	117910	456	BASE, Relay, 2 Poles (see Detail A)	1
30	P	117910	671	HOLDER, Fuse, 2 Pins, 30A, 600V	3
31	P	117911	125	CONTACTOR, 3RT1015-1AK61 SIEMENS (see Detail D)	1
32	P	117911	128	RELAY, Overload, 1.4-2A, 208 V (see Detail D)	1
33	P	117911	131	RELAY, Overload, 1.1-1.6A , 208 V (see Detail D)	1
34	P	117911	655	CONTACTOR, 3RT1034-1AK60 SIEMENS, 208 V (see Detail D)	1
35	P	117911	661	OVERLOAD, 11-16, 400/480 V (see Detail D)	1
36	P	117911	663	OVERLOAD, 22-32A, 208 V (see Detail D)	1
37	P	117911	768	RELAY, Overload, .55-.80A400/480 V (see Detail D)	1
38	P	117911	822	CONTACTOR, 3RT1025-1AK60 SIEMENS, 400/480 V (see Detail D)	1
39	P	117911	831	OVERLOAD, .7-1A400/480 V (see Detail D)	1

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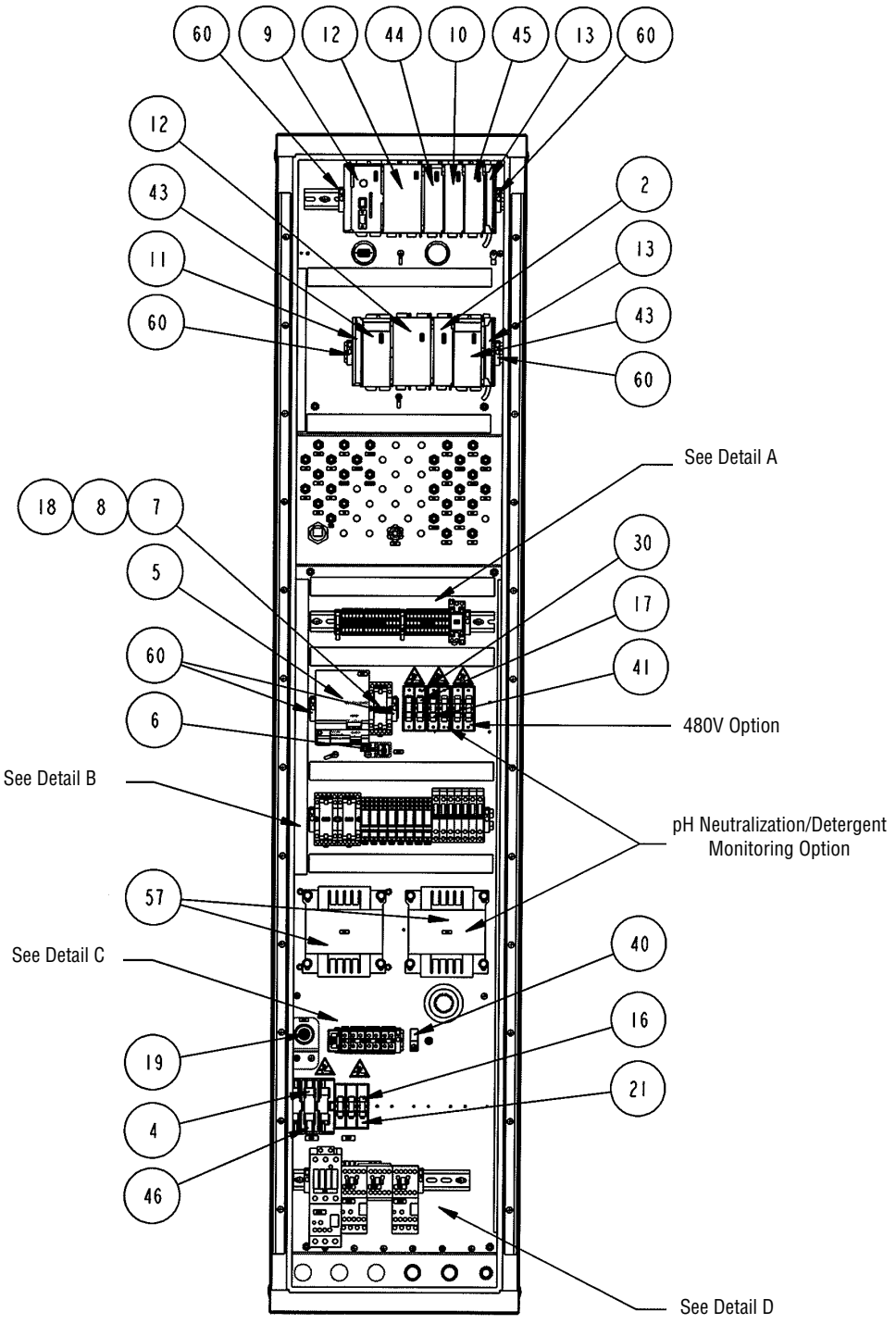

Figure 25b. Electrical Box and Control Column Assembly

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
25b				**ELECTRICAL BOX AND CONTROL COLUMN ASSEMBLY (Cont'd)**	**X**
40	P	117911	987	TERMINAL, Ground, 2-8 AWG	1
41	P	117912	553	FUSE, 4A, 600V, CC Class, KLDR-4	4
42	P	117913	542	CABLE ETHERNET 6'	1
43	P	117914	074	DIGITAL OUTPUT MODULE, 16 Pts, Relay	2
44	P	117914	075	DIGITAL INPUT MODULE, 16 Pts, 24VDC	1
45	P	117914	076	ANALOG INPUT MODULE, 4 Pts, COMPACTLOGIX	1
46	P	117914	538	HOLDER, Fuse, 3P, 30A, 600V	1
47	P	117914	766	RELAY, 2 Poles, 5A, 250VAC (see Detail B)	8
48	P	117914	767	RELAY FIXTURE (see Detail B)	8
49	P	117914	835	SWITCH, Selector, 3 Positions	1
50	P	117914	965	BASE, Relay, 2 Poles, 5A, 250V (see Detail B)	8
51	P	117914	967	FILTER, RC #LZX:RPMU0730 SIEMENS (see Detail B)	8
52	P	117911	833	CONTACTOR, 3RA1315-8XB30-1AK6 SIEMENS, 208 V (see Detail D)	2
53	P	117915	465	BUTTON, EMERGENCY STOP	1
54	P	117916	387	ADAPTOR, Modem, DB25 M/F	1
55	P	117941	378	FUSE, 0.5A, BUSS #AGC-1/2 (see Detail B)	1
56	P	117943	017	ADAPTOR and CONNECTOR, Female, 9 Poles	2
57	P	117951	530	TRANSFORMER, 480/120,1000VA	2
58	P	117952	810	FUSE, 4A, 250V, #313004 SLOW BLOW, 3AG (see Detail B)	4
59	P	117954	353	TERMINAL, Block, 25A, Grey (see Detail A)	24
60	P	117954	354	STOPPER, End (see Detail A, B, C and D)	16
61	P	117954	634	BAR, Jumper, 10 Poles, M4/6 (see Detail A)	3
62	P	117954	670	HUB CAP, Extremity, Grey (see Detail A)	3
63	P	117954	671	HUB CAP, Blue (see Detail C)	1
	P	117916	452	CARD, Memory (Not Shown)	1
64	P	117911	655	CONTACTOR, 3RT1034-1AK60, SIEMENS, 400/480 V (see Detail D)	2

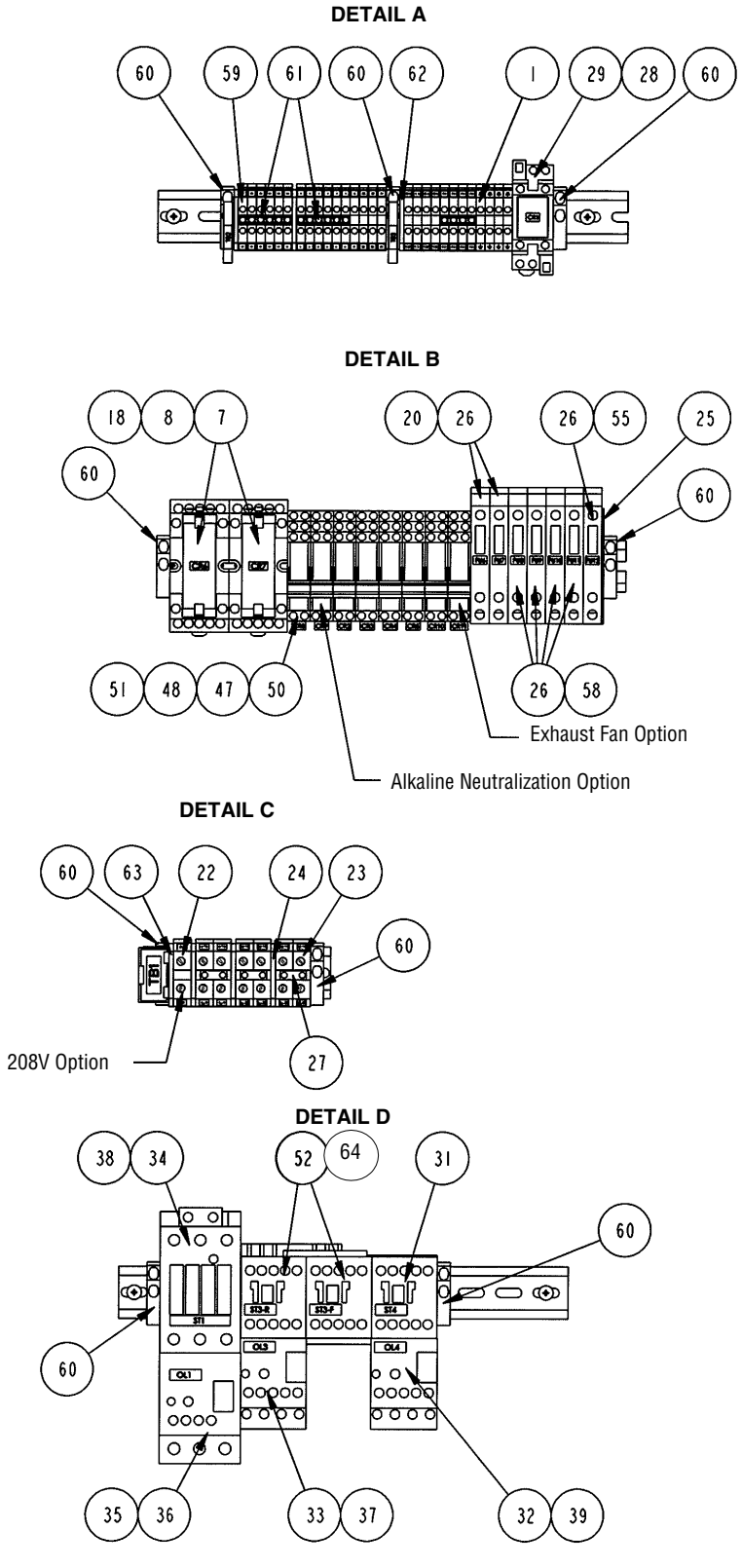

Figure 25c. Electrical Box and Control Column Assembly

FIG. & ITEM NO.	PART NUMBER	DESCRIPTION	UNITS PER ASSEMBLY
25c		**ELECTRICAL BOX AND CONTROL COLUMN ASSEMBLY (Cont'd)** See preceding pages for complete item list.	

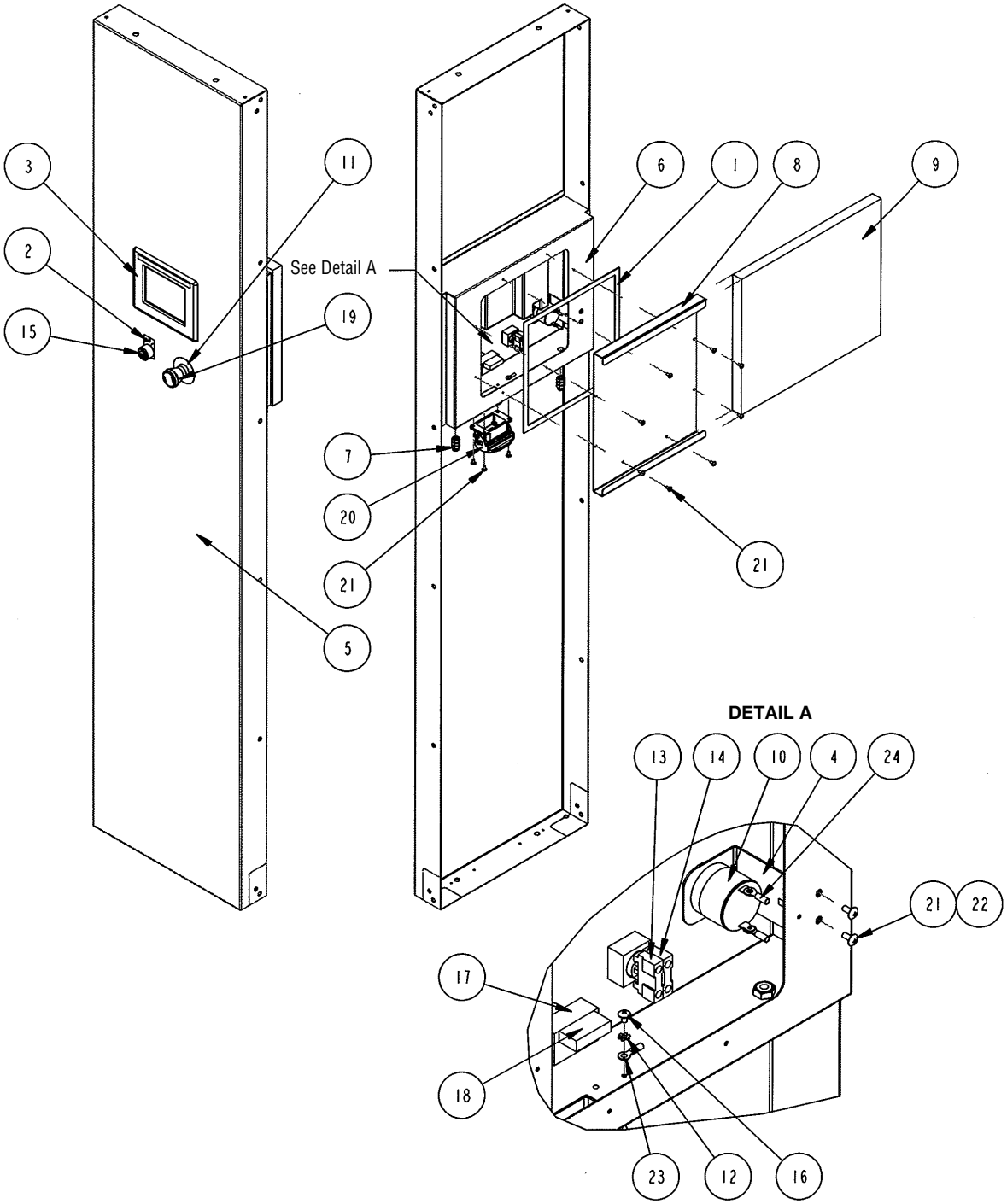

Figure 26. Control Panel

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
26				**CONTROL PANEL**	**X**
1	P	117018	671	SILICONE STRIP, 1/16" X 1/2", Adhesive	1
2	P	117040	369	STICKER, LOCK/UNLOCK/INIT	1
3	P	117050	347	SCREEN, A-B	2
4	P	117050	360	SUPPORT, Audible Signal Device	2
5	P	117050	449	BOX, Load Side, Metal Sheet	1
6	P	117050	450	COVER, Load Side, Metal Sheet	1
7	P	117052	360	CABLE PB2, EMERG.STOP, Unload Panel	2
8	P	117053	249	REAR COVER, Control Panel, Load Side	1
9				INSULATION, Mineral Wood, Panel, 1" x 13-1/2" x 16"	1
10	P	117908	128	ALARM, Audible, 95 dB, 120V #SC110NP	2
11	P	117909	909	PLATE, Legend, EMERGENCY STOP, Yellow	1
12	P	117909	999	LOCKWASHER, Dented, for Screw #8	1
13	P	117913	385	CONTACT BLOCK, N.C. #3SB3400-0C	1
14	P	117913	842	CONTACT BLOCK, N.O. #3SB3400-0B	1
15	P	117914	835	SELECTOR SWITCH, 3 Positions	1
16	P	117914	974	SCREW, Truss Head, S/S, 8-32 x 1/4"	1
17	P	117915	460	MOUNTING LATCH, #800F-ALP A-B	1
18	P	117915	463	CONTACT BLOCK, 1 N.C.	1
19	P	117915	465	BUTTON, EMERGENCY STOP	2
20	P	117943	017	ADAPTOR and CONNECTOR, F, 9 Poles	1
21	P	117950	856	SCREW, Truss Head, S/S, 8-32 X 3/8", Nylok	14
22	P	117950	950	NUT, S/S, 8-32	2
23	P	117954	649	TERMINAL, Ring, #16-14, Blue, #10 Screw, 3416	1
24	P	117956	127	TERMINAL, Ring, #22-18, Red, #8 Screw AMP	2

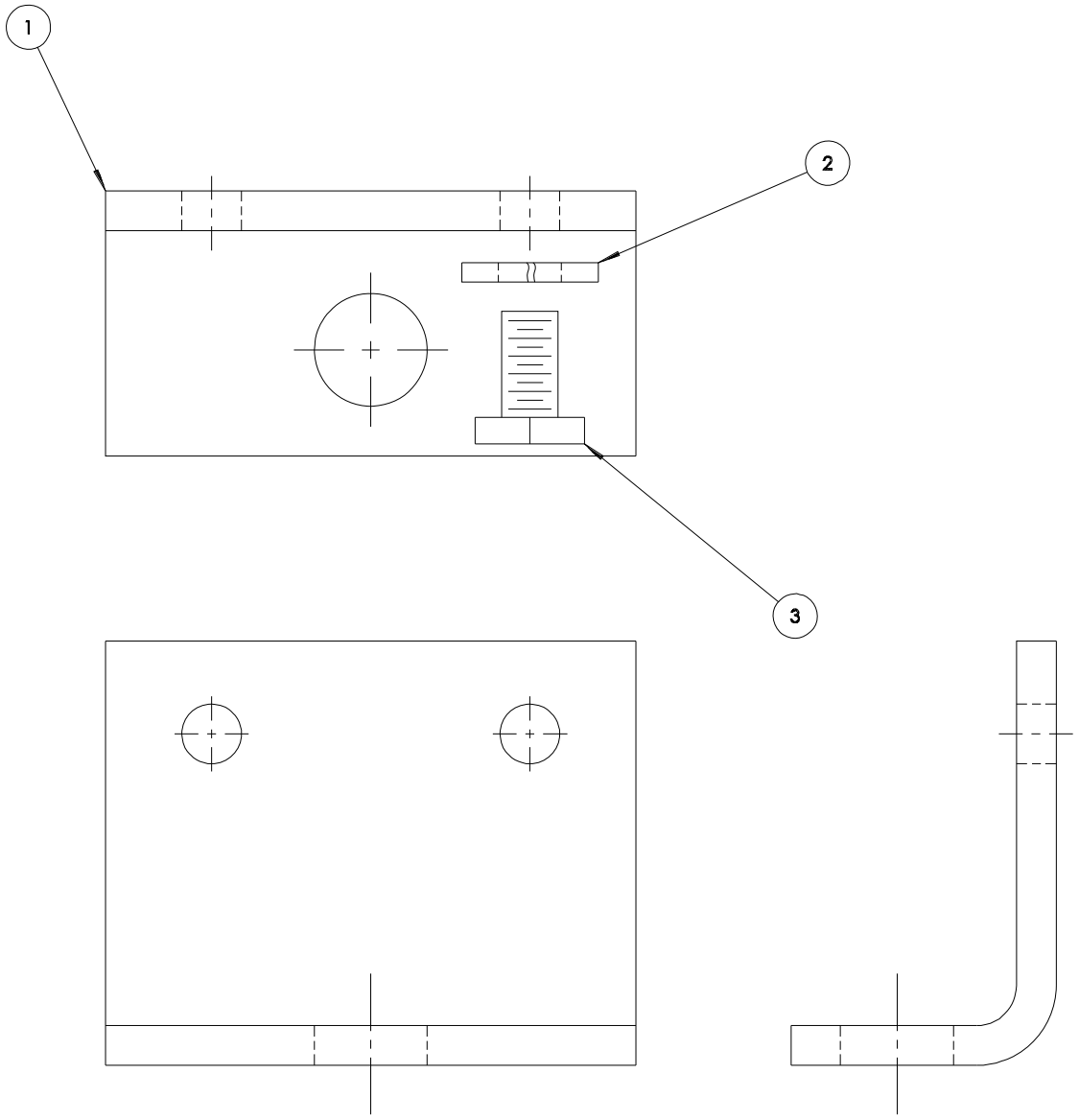

Figure 27. Seismic Tie-Down Anchorage – Option

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
27				**SEISMIC TIE-DOWN ANCHORAGE – OPTION .....**	**X**			
1	P	117990	574	TIE, Brace, Angle, Seismic, 1"	4			
2	P	117950	989	LOCKWASHER, S/S, 1/2"	8			
3	P	117906	771	BOLT, S/S, 1/2"-13 x 1"	8			

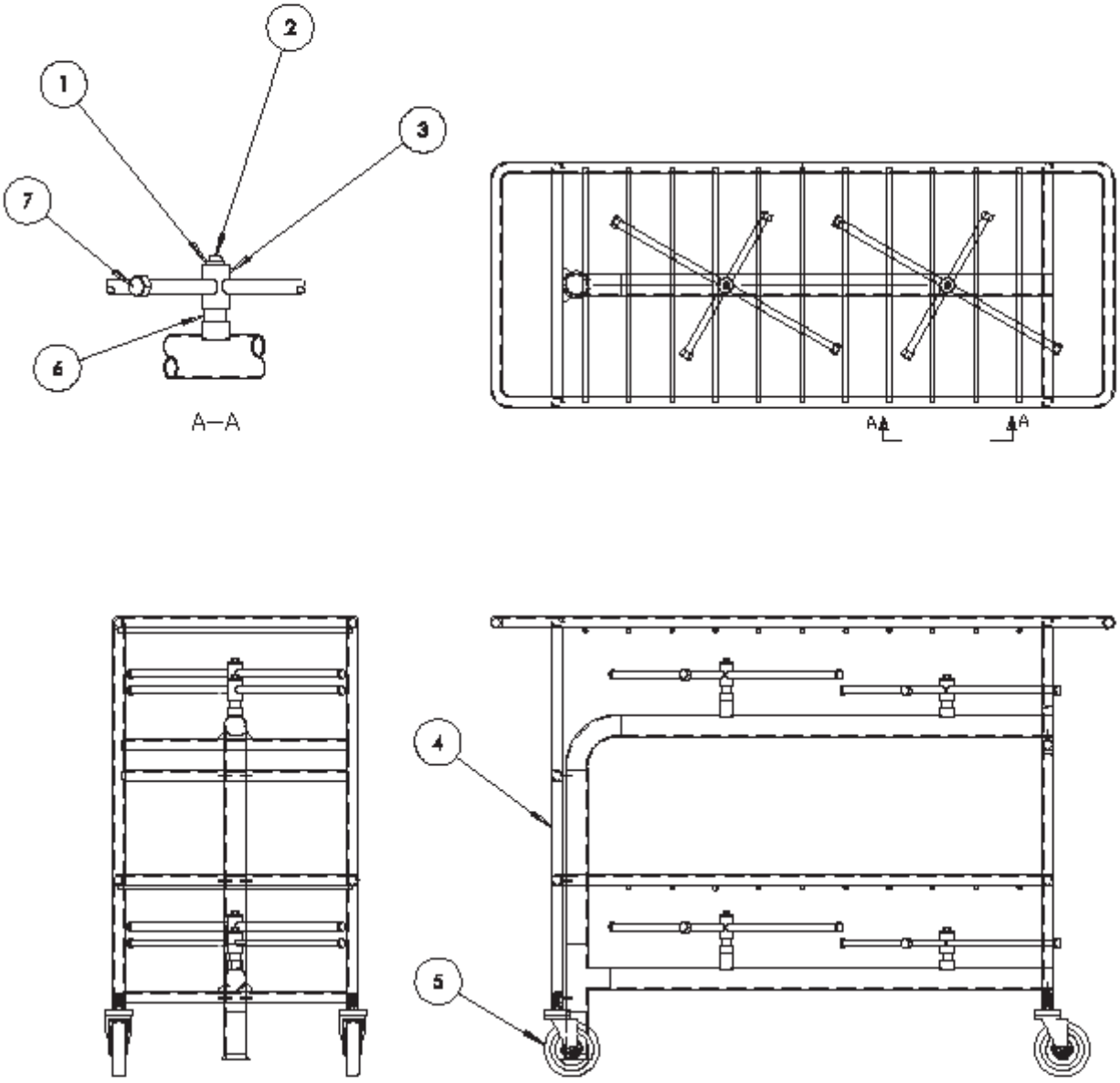

Figure 28. Bottle Washing Cart (WA02-010)

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
28				**BOTTLE WASHING CART (WA02-010)..... (4 Baskets Capacity)**	**X**
1	P	117941	596	WASHER, UHMW, 7/8" Ø.....	4
2	P	117941	595	SCREW, S/S, 5/16"-18, Modified.....	4
3	P	117941	598	SPRAY ARM, Assembly, Bottle Washing Cart, Pop-Up	4
4	P	117942	914	CART, Bottle Washing, 4 Baskets, Pop-Up	1
5	P	117941	132	WHEEL, Swivel.....	4
6	P	117941	594	ARBOR, Spray, Rotating.....	4
7	P	117941	688	CAP PLUG, Nylon, 3/8"F	1

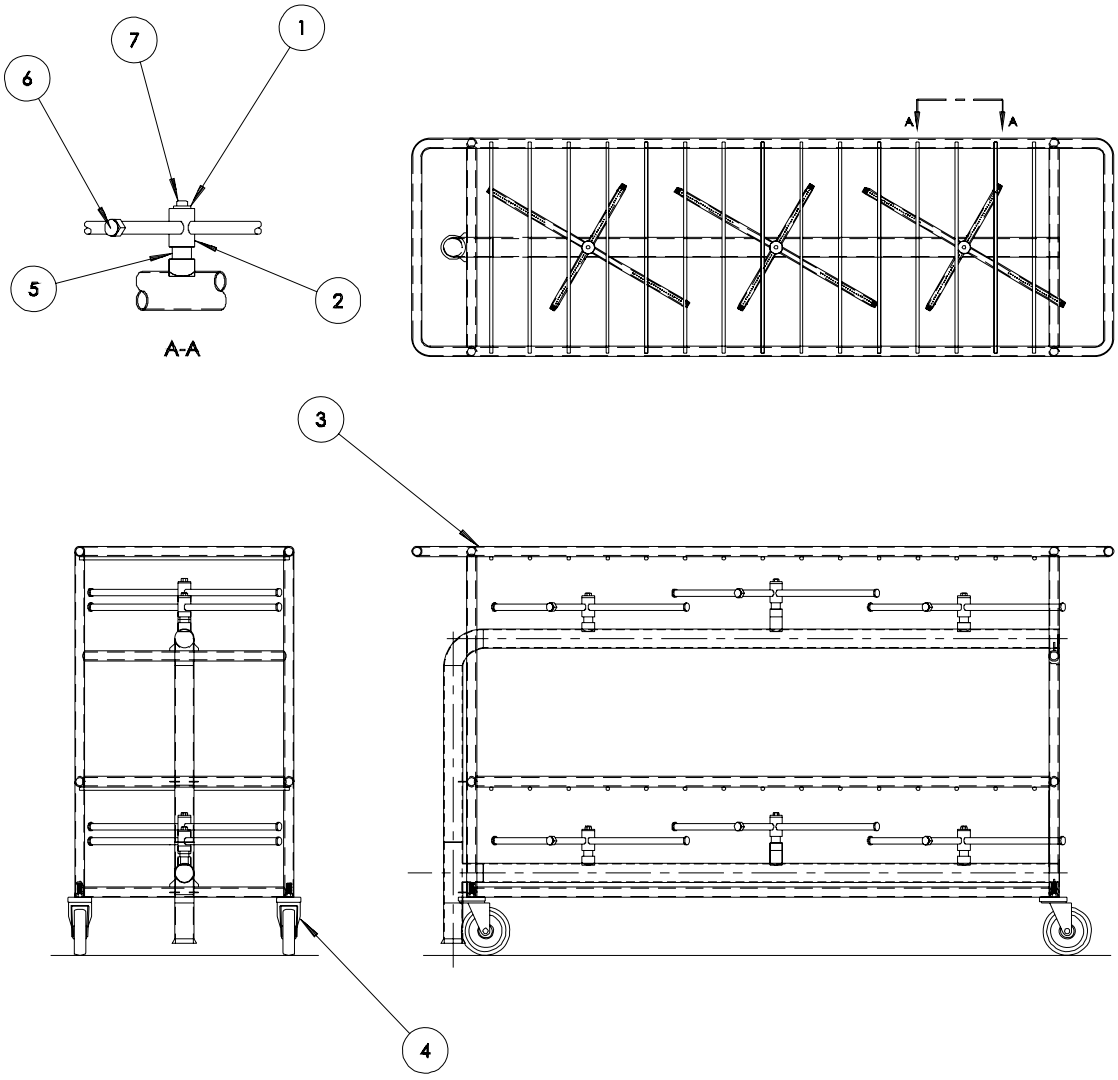

Figure 29. Bottle Washing Cart (WA02-020)

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
29				**BOTTLE WASHING CART (WA02-020) ..... (6 Baskets Capacity)**	**X**
1	P	117941	596	WASHER, UHMW, 7/8" Ø.....	6
2	P	117941	598	SPRAY ARM, Assembly, Bottle Washing Cart, Pop-Up	6
3	P	117942	913	CART, Bottle Washing, Basket, Pop-Up.....	1
4	P	117941	132	WHEEL, Swivel.....	4
5	P	117941	594	ARBOR, Spray, Rotating.....	6
6	P	117941	688	CAP PLUG, Nylon, 3/8"F	1
7	P	117941	595	SCREW, S/S, 5/16"-18, Modified.....	6

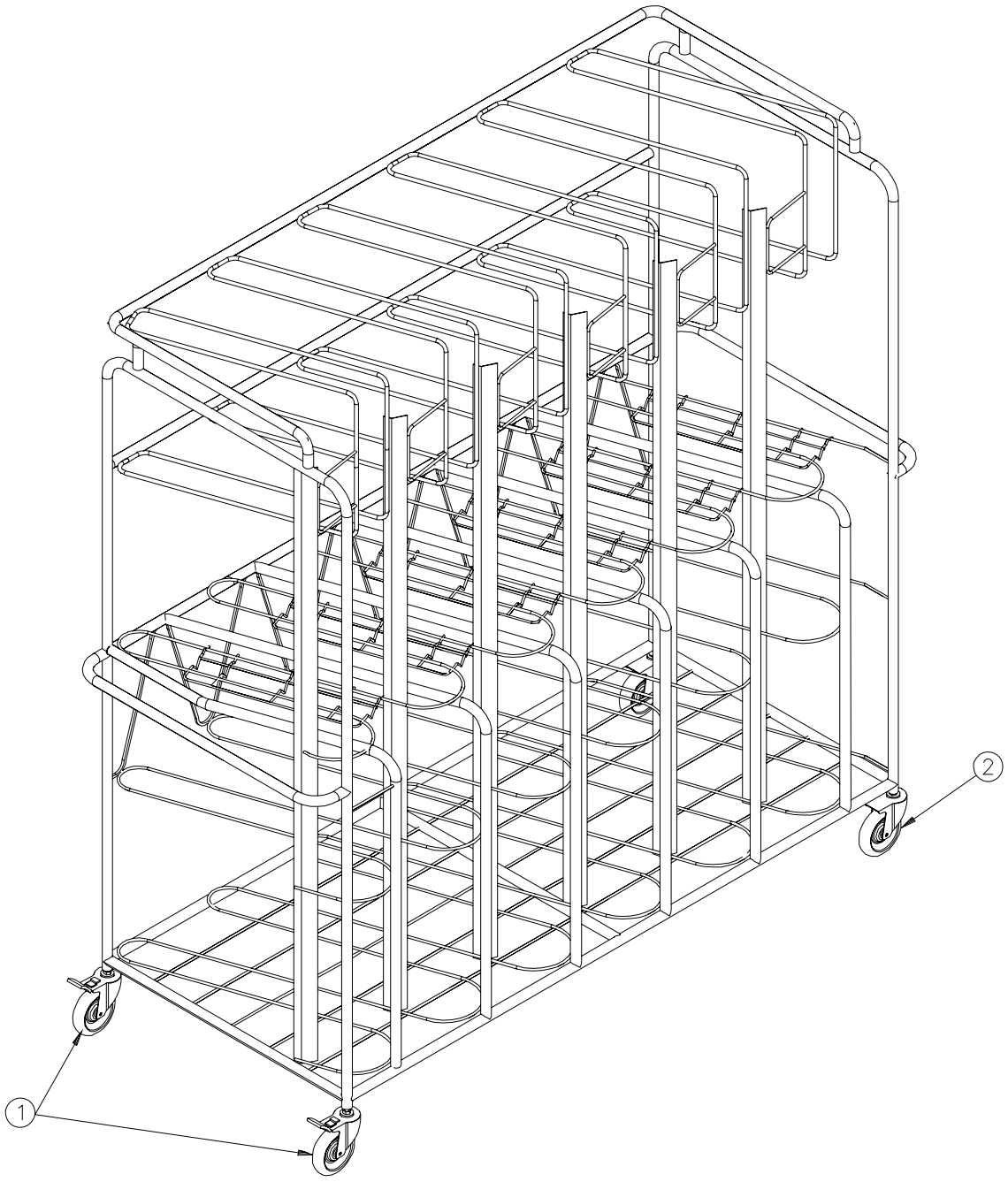

Figure 30. Pan Cart (WA02-030) (Accessory)

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
30				**PAN CART (WA02-030) (Accessory)**	
1	P	117909	886	WHEEL, Swivel, S/S, 5" Dia. With Brake	2
	P	117912	503	• RUBBER BOOT, (Not shown)	2
2	P	117909	887	WHEEL, Swivel, S/S, 5" Dia. Without Brake	2

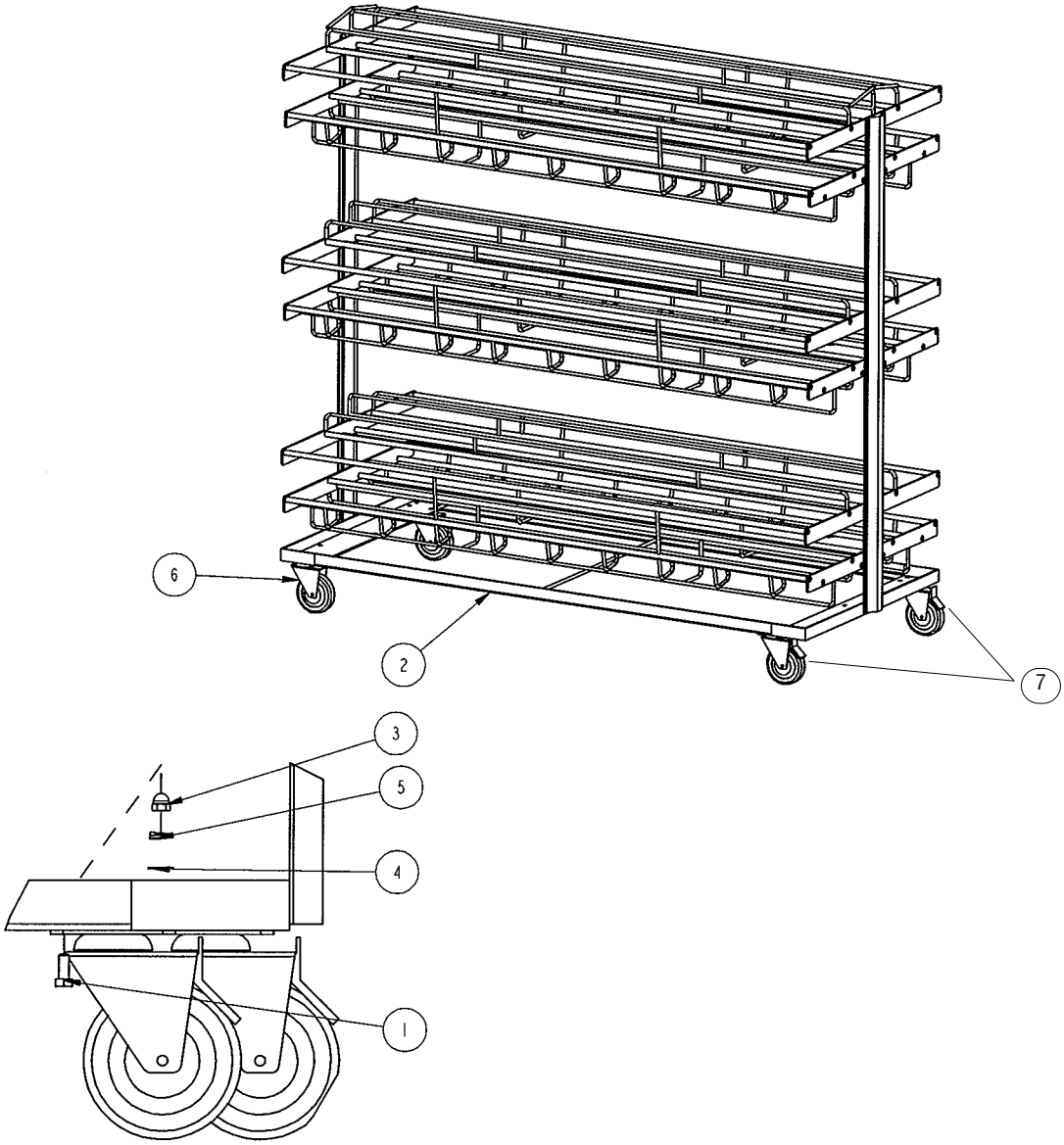

Figure 31. Universal Cage and Pan Wash Cart (WA03-100)

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY
31				**UNIVERSAL CAGE AND PAN WASH CART (WA03-100) .....**	**X**
1	P	117950	905	BOLT, S/S, 5/16"-18 x 3/4"	16
2	P	117998	718	UNIVERSAL CART FOR CAGE AND PAN	1
3	P	117957	201	CAP NUT, S/S, 5/16"-18	16
4	P	117950	977	WASHER, S/S, 5/16"	16
5	P	117950	988	LOCKWASHER, S/S, 3/8"	16
6	P	117909	886	WHEEL, Swivel, S/S, 5" Ø, Without Brake	2
7	P	117909	887	WHEEL, Swivel, S/S, 5" Ø, With Brake	2

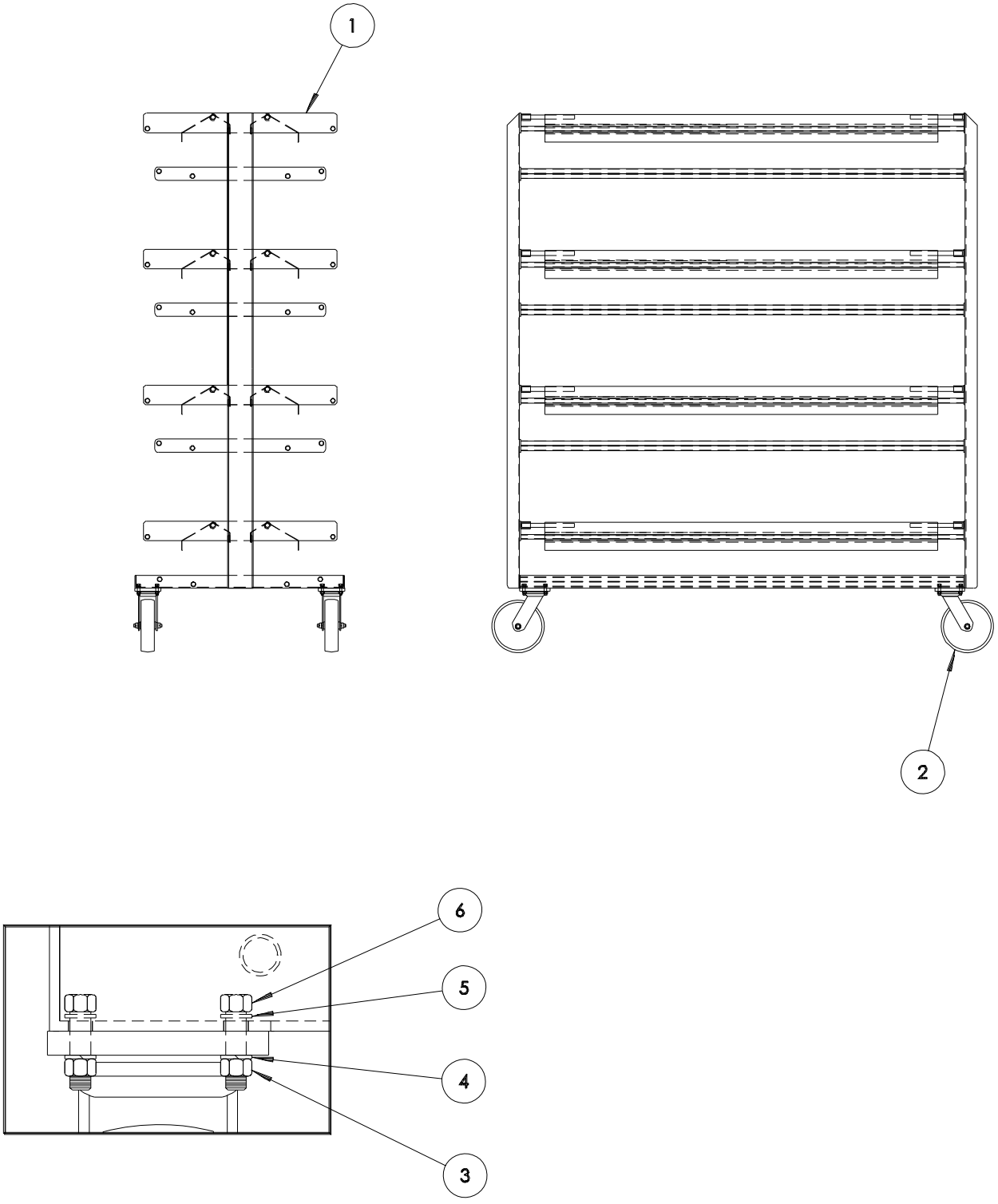

Figure 32. Universal Cage Wash Cart (WA02-040)

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
32				**UNIVERSAL CAGE WASH CART (WA02-040) .....**	**X**			
1	P	117942	243	UNIVERSAL CAGE WASH CART	1			
2	P	117942	241	WHEEL, Swivel, S/S	4			
3	P	117950	915	NUT, S/S, 3/8"-16	16			
4	P	117950	988	LOCKWASHER, S/S, 3/8"	16			
5	P	117952	803	WASHER, S/S, 7/16"	16			
6	P	117950	915	BOLT, S/S, 3/8"-16 x 3/4"	16			

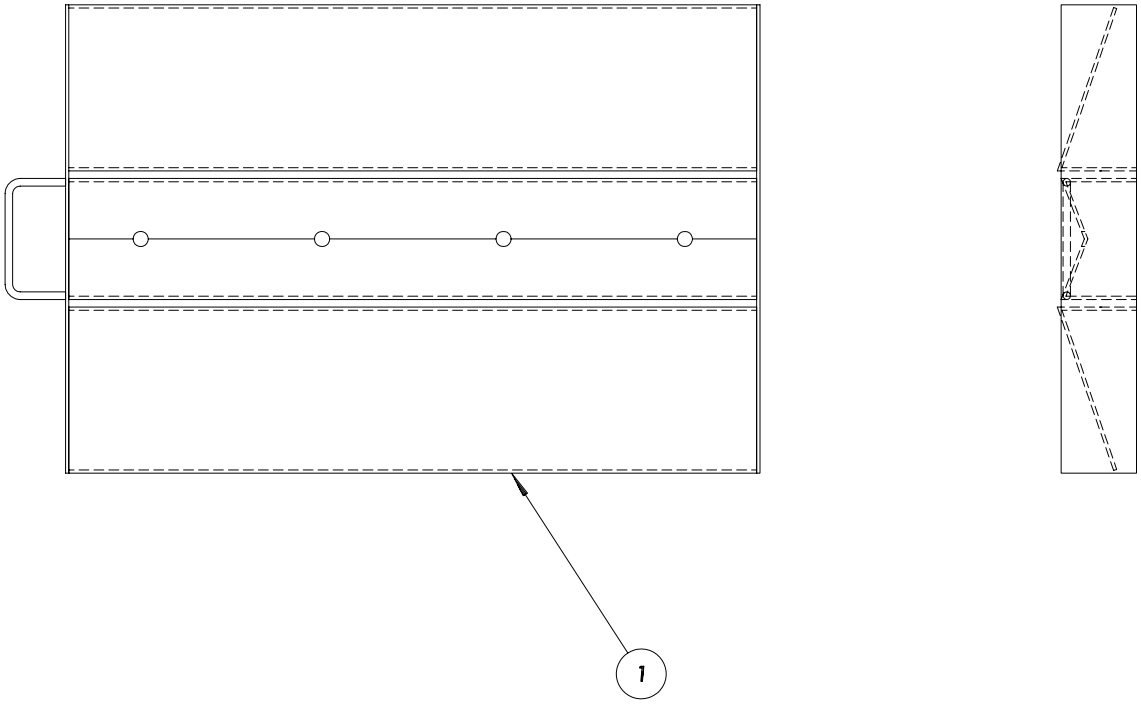

Figure 33. Cart Tilt Ramp (WA02-050)

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
33				**CART TILT RAMP (WA02-050) .....**	**X**			
1	P	117991	785	RAMP ASSEMBLY WITH PITCH FOR CAGE.....	1			

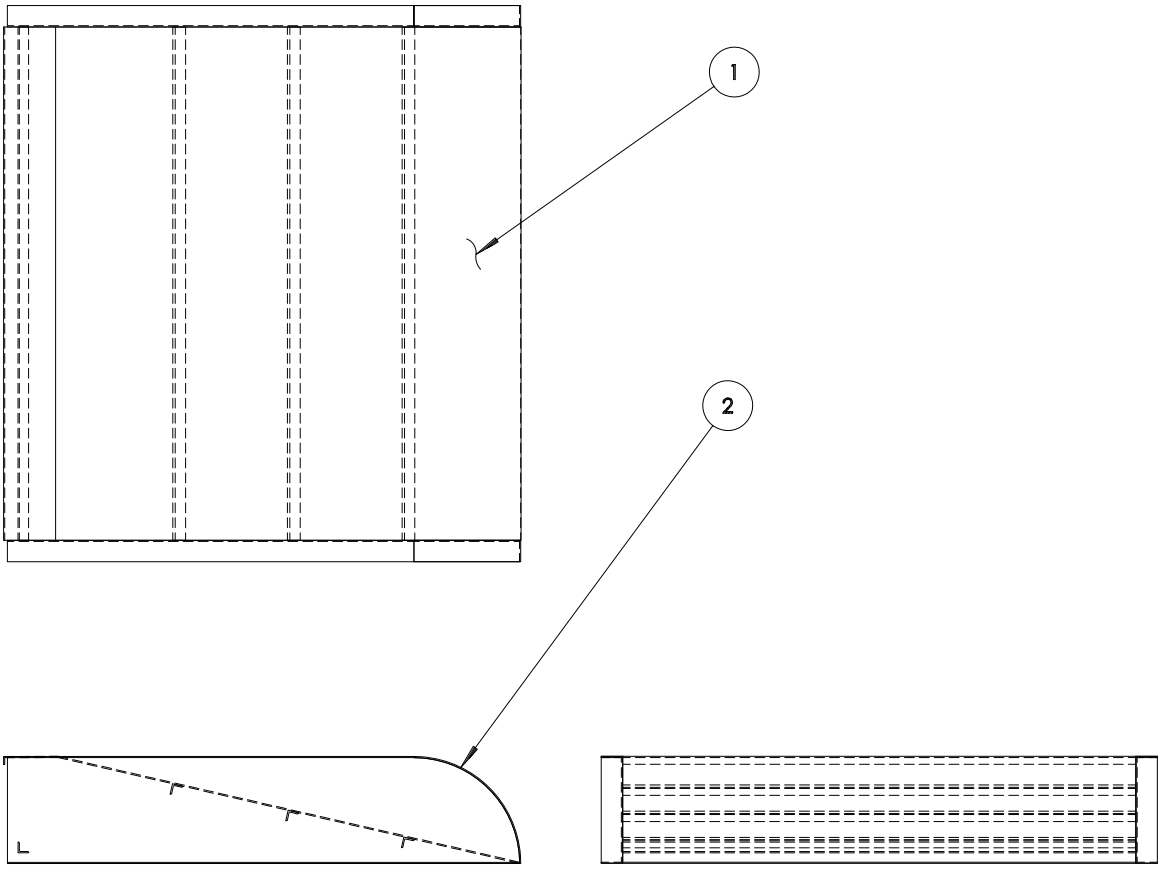

Figure 34. Floor Ramp for Floor Mounted Units (WA02-060)

FIG. & ITEM NO.	PART NUMBER			DESCRIPTION	UNITS PER ASSEMBLY			
34				**FLOOR RAMP FOR FLOOR MOUNTED UNITS (WA02-060)** **Single Door Units**	**X**			
				Double Door Units		**X**		
1	P	117941	229	RAMP ASSEMBLY	1	2		
2	P	117940	143	RUBBER, Corrugated, 1/8" x 48" Long	54"	108"		
	P	117956	753	CONTACT GLUE IN GEL, 946 mL (Not Shown)	A/R	A/R		

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Document N°.
920-509-969

Modèle/Model
BASIL® 4700
CAGE AND RACK WASHER

Type de document/Document Type
CYCLE DESCRIPTION CHART

Titre/Title
CYCLE CHART FOR BASIL 4700

No. rév./ Rev No.	Date rév/ Rev. Date	HISTORIQUE DES CHANGEMENTS / HISTORY CHANGES
0	2007-05-29	New Document
1	2007-09-05	Update temperature range in Celsius
1.1	2008-10-02	DCTAS09-497, CORRECTION DU MOT CONTAINMENT

Approuvé par/Approved by:

Nom/Name

SÉBASTIEN GIGUÈRE

Signature

Sigu 08/10/01

PRÉPARÉ PAR/PREPARED BY:
Yanick Beaudoin

DISTRIBUTION:
MANUEL OPÉRATEUR 920-509-645
MANUEL DE MAINTENANCE 764-333-098

Basil 4700 Cage and Rack Washer - Cycle Description Chart

	PRE-WASH		ALKALINE WASH		ACID WASH		ACID SOAK		RINSE 1		RINSE 2		FINAL RINSE		EXHAUST	
PHASE:	RECIRCULATED		RECIRCULATED		RECIRCULATED				RECIRCULATED		RECIRCULATED		RECIRCULATED			
CIRCULATION [1] TIME:	DEFAULT 01:00	SELECT [00:00 TO 99:59]	DEFAULT 05:00	SELECT [00:00 TO 49:59]	DEFAULT 05:00	SELECT [00:00 TO 49:59]	DEFAULT 01:30	SELECT [00:00 TO 99:59]	DEFAULT 01:30	SELECT [00:00 TO 49:59]	DEFAULT 01:30	SELECT [00:00 TO 49:59]	DEFAULT 01:30	SELECT [00:00 TO 49:59]	DEFAULT 01:30	SELECT [00:00 TO 99:59]
INJECTION PUMP SELECTION:			ALKALINE DETERGENT PUMP		ACID DETERGENT PUMP											
WATER TYPE OR AIR TEMP	HTW		HEATED 140.0°F (60°C)	[HEATED 70.0F (21.1°C) TO 185°F (85°C)]	HEATED 140.0°F (60°C)	[HEATED 70.0F (21.1°C) TO 185°F (85°C)]			HEATED 180.0°F (82.2°C)	[HEATED 70.0F (21.1°C) TO 185°F (85°C)]	HEATED 180.0°F (82.2°C)	[HEATED 70.0F (21.1°C) TO 185°F (85°C)]	HEATED 180.0°F (82.2°C)	[HEATED 70.0F (21.1°C) TO 185°F (85°C)]		

CYCLE 1	X	X	X	X	X	X	X	X
CYCLE 2	X	X	X	X	X	X	X	X
CYCLE 3	X	X	X	X	X	X	X	X
CYCLE 4	X	X	X	X	X	X	X	X
CYCLE 5	X	X	X	X	X	X	X	X
CYCLE 6	X	X	X	X	X	X	X	X
CYCLE 7	X	X	X	X	X	X	X	X
CYCLE 8	X	X	X	X	X	X	X	X
CYCLE 9	X	X	X	X	X	X	X	X
CYCLE 10	X	X	X	X	X	X	X	X
CYCLE 11	X	X	X	X	X	X	X	X
CYCLE 12	X	X	X	X	X	X	X	X

DEFAULT VALUES NOT SHOWN ON CHART (ADJUSTABLE IN SERVICE MODE ONLY)

SUMP FILL ALARM TIME:		300 (60-6000)	PH MONITORING LIMITS	LOW	06 Ph (01-14 Ph)	NUMBER OF CHEMICAL PUMPS	3 (02 TO 04)
SUMP DRAIN ALARM TIME:		60 (01-6000)		HIGH	09 Ph (01-14 Ph)	COMPLETE CYCLE ALARM TIME	60 (01-6000)
SUMP HEATING ALARM:		600 (60-3000)	PH MIXING TIME		45 (01-99)	DETERGENT MONITORING	180 (01-6000)
ALKALINE NEUTRALIZER	INJECT:	5 (02-99)	PH NUMBER OF TRIES		9 (03 TO 15)	DETERGENT INJECTION (CONDUCTIVITY)	500 (100-40000)
	WAIT:	45 (30-99)	ALKALINE CONTAINMENT INJ. TIME		2 (01-98)	DETERGENT INJECTION (TIME BASED)	10 (0-999)
ACID NEUTRALIZER	INJECT:	10 (02-99)	ACID CONTAINMENT INJ. TIME		6 (01-98)		
	WAIT:	45 (30-99)					

X RECOMMENDED

NOT APPLICABLE

VALUES ADJUSTABLE BY THE OPERATOR IN AUTOMATIC MODE

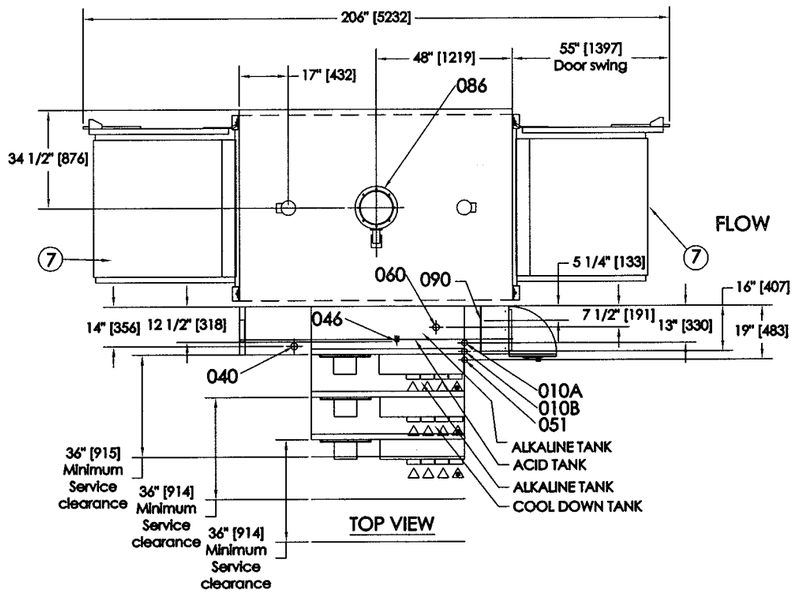
CTW= COLD TAP WATER
HTW= HOT TAP WATER

RESERVICE IN 100 DAYS
RESERVICE IN 1000 CYCLES
CYCLE COUNT: 00000001 (TYPICAL)

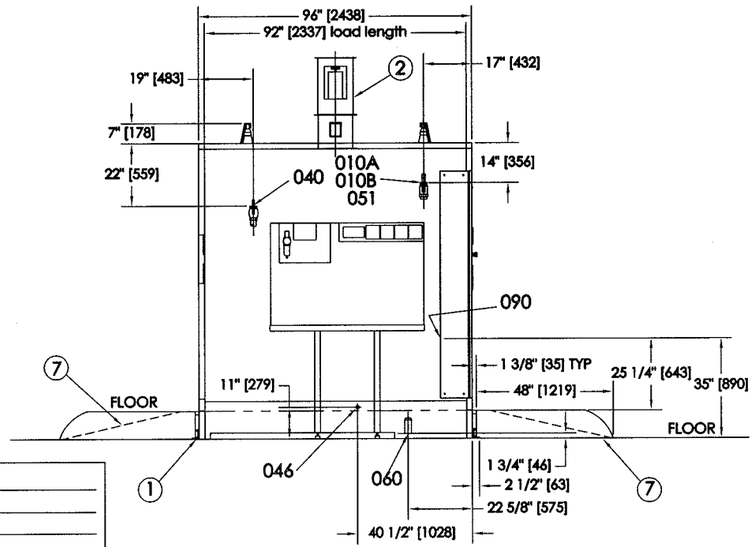
REVISION: 1,1 (2008-10-02)
REF.: #920-509-969

DWG. NO.	SHEET OF
920-509-921	1 3

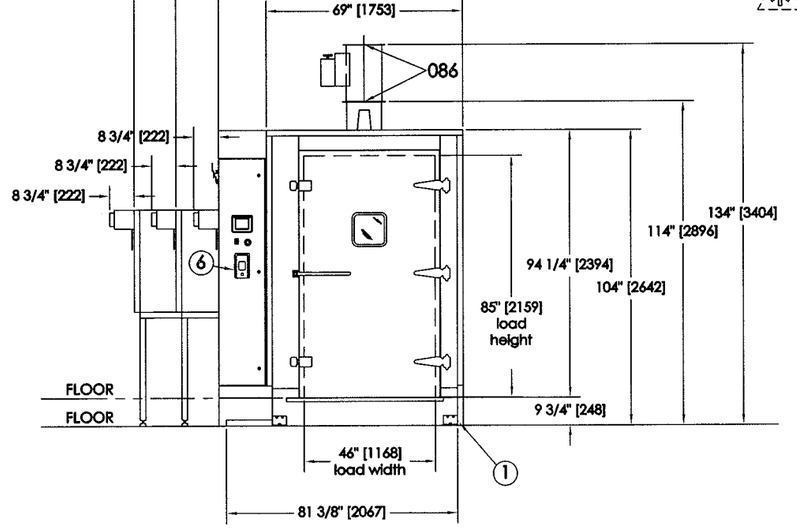
ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-441	2.1	2008-02-05



TOP VIEW



SIDE VIEW



FRONT VIEW

OPTION

1. OPTIONAL
   SEISMIC TIE-DOWN (WS25-0100)
2. OPTIONAL
   EXHAUST FAN (WS25-0015)
3. OPTIONAL
   HEAT EXCHANGER (WS25-0003)
4. OPTIONAL
   REUSABLE-THROWAWAY ACID DET (WS25-0063)
5. OPTIONAL
   REUSABLE-THROWAWAY ALKALINE DET (WS25-0013)
6. OPTIONAL
   PRINTER (WS25-0049)

ACCESSORY

7. OPTIONAL
   FLOOR RAMPS (WA02-060)

EQUIPMENT NUMBER WR32- ? ? ?

- ? = 1: 208V, 60Hz, 3ph
- ? = 3: 480V, 60Hz, 3ph
- ? = 2: LEFT SERVICE, FLOOR MOUNTE
- ? = 4: LEFT SERVICE, PIT MOUNTED
- WR32- = 2: DOUBLE DOOR

△ STANDARD DETERGENT PUMP

PH NEUTRALIZATION AND DETERGENT MONITORING SYSTEM (WS25-0052)

NOTE A: IF INCLINE FLOOR GRADING OPTION
SELECTED LOAD HEIGHT BECOMES 84" [2134]

INTERFACE LEGEND	
010A	HOT WATER
010B	COLD WATER
040	STEAM
046	CONDENSATE RETURN
051	AIR
060	DRAIN CONNECTION
086	VENTILATION
090	ELECTRICITY
⊕	CONNECTION

Project: _____
EQUIP#: _____
S/N: _____
CUST. PO#: _____
STERIS PO#: _____

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by: _____
date: _____
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by: _____
date: _____
☐ certified as built
by: _____
date: _____

LEFT HAND, FLOOR MOUNTED

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TITLE
BASIL®4700
CAGE AND RACK WASHER
EQUIPEMENT DRAWING

DWN. M.Is	CKD. MTC	CKD.	ENG. YTF
DATE 2007-06-19	DATE 2008-03-31	DATE 08/03/31	DATE 2008/03/31

DWG. NO. 920-509-921 | SHEET OF 1 3

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OPTION

① OPTIONAL
SEISMIC TIE-DOWN (WS25-0100)

② OPTIONAL
EXHAUST FAN (WS25-0015)

③ OPTIONAL
HEAT EXCHANGER (WS25-0003)

④ OPTIONAL
REUSABLE-THROWAWAY ACID DET (WS25-0063)

⑤ OPTIONAL
REUSABLE-THROWAWAY ALKALINE DET (WS25-0013)

⑥ OPTIONAL
PRINTER (WS25-0049)

ACCESSORY

⑦ OPTIONAL
FLOOR RAMPS (WA02-060)

△ STANDARD DETERGENT PUMP

PH NEUTRALIZATION AND DETERGENT MONITORING SYSTEM (WS25-0052)

NOTE A: IF INCLINE FLOOR GRADING OPTION
SELECTED LOAD HEIGHT BECOMES 84" [2134]

EQUIPMENT NUMBER WR32- ? ? ?
- ? = 1: 208V, 60Hz, 3ph; 3: 480V, 60Hz, 3ph
- ? = 1: RIGHT SERVICE, FLOOR MOUNTED; 3: RIGHT SERVICE, PIT MOUNTED
- ? = 2: DOUBLE DOOR

INTERFACE LEGEND	
010A	HOT WATER
010B	COLD WATER
040	STEAM
046	CONDENSATE RETURN
051	AIR
060	DRAIN CONNECTION
086	VENTILATION
090	ELECTRICITY
⊕	CONNECTION

Project: _____
EQUIP#: _____
S/N: _____
CUST. PO#: _____
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date: _____
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by: _____
date: _____
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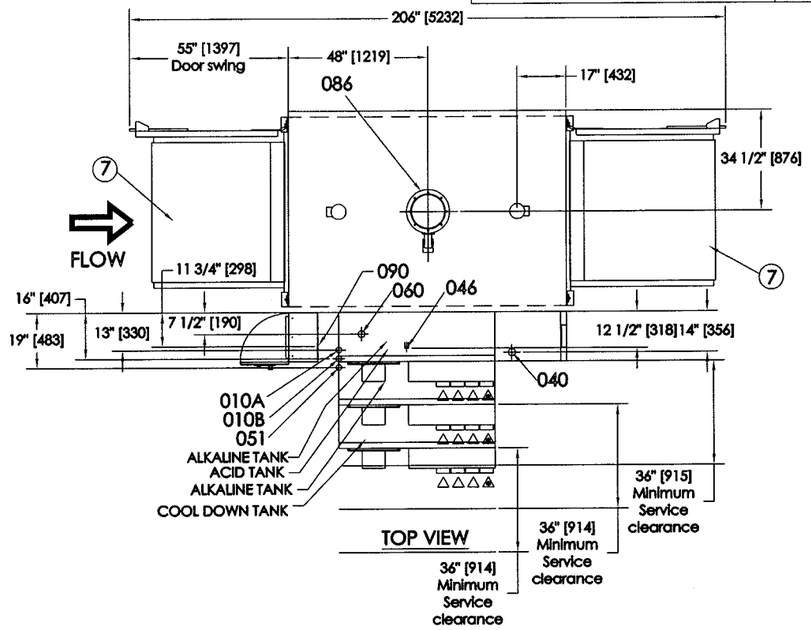
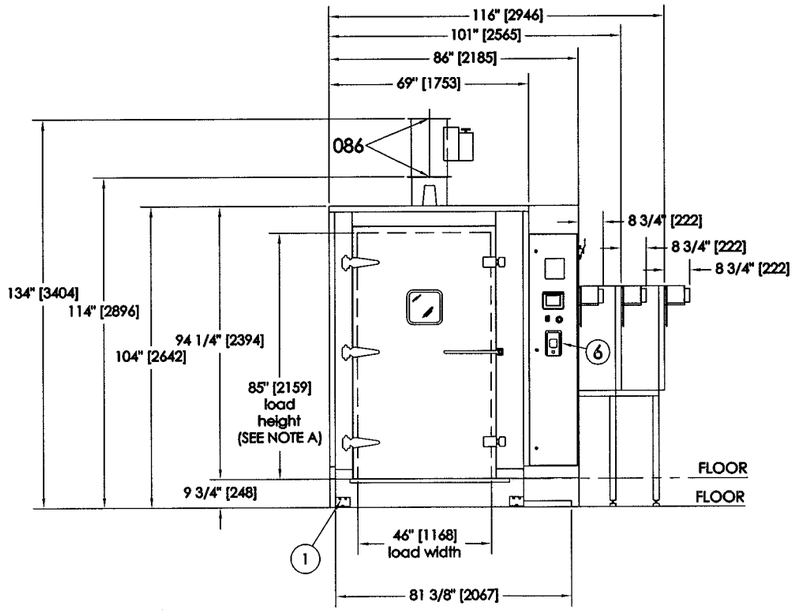
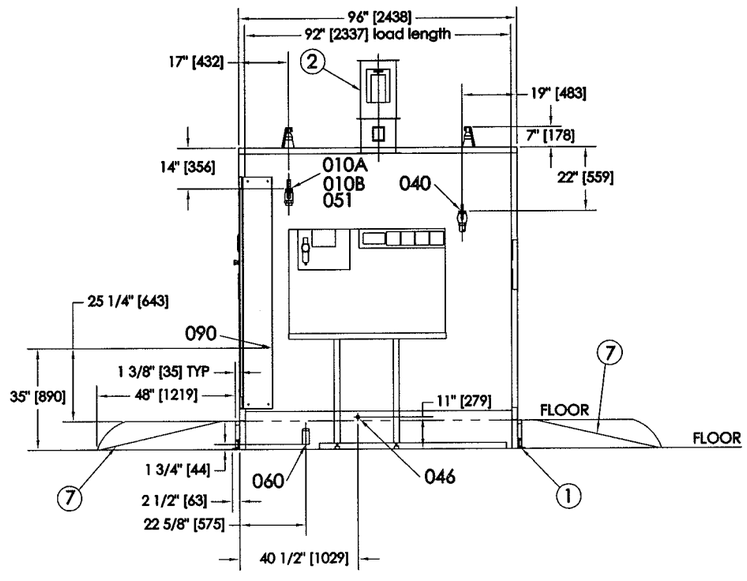
by: _____
date: _____



TOP VIEW



FRONT VIEW



SIDE VIEW

RIGHT HAND, FLOOR MOUNTED

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DATE 2007-06-19	DATE 2008-03-31	DATE 08/03/31	DATE 2008/03/31

TITLE
BASIL®4700
CAGE AND RACK WASHER
EQUIPEMENT DRAWING

DWG. NO. 920-509-921 | SHEET 1 OF 3

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ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-441	2.1	2008-02-05

DYNAMIC UTILITY REQUIREMENTS CHART

	DESCRIPTION	CONNECTION TYPE	CONNECTION SIZE	PRESSURE RANGE	OPERATING CONSUMPTION BASIL 4600 MAX. FLOW: - US gpm [l/Min.]	NOMINAL TEMP.	AIR QUALITY	WATER QUALITY	COMMENTS
010A	HOT WATER	NPT	1" [25 mm]	30 psig - 36 psig [2 - 2.5 bar] Dyn 90 psig static max	22 - 32 gpm (83-120 L/Min.)	140°F [60°C] MIN.			
010B	COLD WATER (*)	NPT	1"1/2" [38 mm]	30 psig - 36 psig [2 - 2.5 bar] Dyn 90 psig static max	22 gpm (83-120 L/Min.)	60°F [15°C] MAX.			
040	STEAM	NPT	1 1/2" [38 mm]	50 - 80 psig dyn. [3.4-5.5 bar] 90 psig static max	607lb/hr [276 kg/hr] @ 50 psig dyn 872lb/hr [396 kg/hr] @ 80 psig dyn. Momentary peak of 1300 lb/hr [591 kg/hr]				SEE NOTE 5
046	CONDENSATE RETURN	NPT	1" [25 mm]	-	1.8 US gpm [6.6 L/Min.] average				SEE NOTE 6
051	COMPRESSED AIR	NPT	3/8" [10 mm]	75 psig min. [5.17 bar] 125 psig max. [8.62 bar]	1-2 cfm [.03 - .06 m³/min]				
060	DRAIN CONNECTION (A) (B)	NPT	3" [75 mm]	-	-				
086	VENTILATION	I.D.	12" I.D. [305 mm]	-	Average: Flow rate 100 cfm (170m3/hr) Peak Flow rate 500 cfm (850m3/hr)	Satured vapor 165°F [74°C] MIN. 185°F [85°C] MAX.			SEE NOTE 7
090	ELECTRICITY	CONDUIT	3/4" [19 mm]	-	-	-			

(*) IF COLD WATER REQUIREMENT ARE NOT MET, DRAIN DISCHARGE MAY EXCEED 140°F [60°C].
(*) IF DRAIN DISCHARGE COOLDOWN SYSTEM WITH SIDE TANK AND TEMPERATURE GUARANTEE.
(A) A 4" [102 mm] FLOOR FUNNEL OR OPEN DRAIN AND 4" [102 mm] FLOOR SINK ARE RECOMMENDED.
(B) IF COLD WATER REQUIREMENTS ARE NOT MET, DRAIN DISCHARGE MAY EXCEED 140°F [60°C].

OPERATING VOLTAGE			480 V, 60Hz
3 ≂ SUPPLY REQUIRED	/	MAX. PROTECTION	15 A/30 A

OPERATING VOLTAGE			208 V, 60Hz
3 ≂ SUPPLY REQUIRED	/	MAX. PROTECTION	25A/40A

Heat loss - BTU/H at 75° F [24°C]
Each door side = 9 000 BTU/H [2700 W]
Service side + Non Service side + top = 15 000 BTU/H [4300 W]
Total = 33 000 BTU/H [9700 W]

NOTE:

1. ISOLATION VALVES, VACUUM BREAKERS AND A LOCKABLE FUSED DISCONNECT SWITCH ON UTILITY LINES TO WASHER ARE REQUIRED. PROVIDED BY OTHER.
2. ALL CONNECTIONS SHOULD BE IN ACCORDANCE WITH LOCAL CODES.
3. ALL UTILITY CONNECTIONS ARE WITHIN +/-3" [76 mm] OF DIMENSIONS SPECIFIED.
4. PIPE SIZE SHOWN INDICATE TERMINAL OUTLET ONLY FOR EQUIPMENT
5. IF STEAM FLOW RATES ARE NOT MET, HEATING AND CYCLE TIME MAY BE INCREASED.
6. CONDENSATE TO BE CONNECTED TO A NON-PRESSURIZED GRAVITY RETURN MAIN OR VENTED CONDENSATE RECEIVER. ADD 1/2" psi [3.45 kPa] FOR EACH 12" [305 mm] OF CONDENSATE HEAD PRESSURE TO THE MINIMUM DYNAMIC STEAM PRESSURE: MAXIMUM RISE NOT TO EXCEED A TOTAL OF 15 FEET [4.57 m] HEAD.
7. IT IS RECOMMENDED TO CONSTRUCT THE EXHAUST DUCT SYSTEM FROM STAINLESS STEEL AND SEAL THE JOINTS BY WELDING TO ENSURE A CORROSION RESISTANT AND LEAK PROOF SYSTEM FOR REMOVAL OF CONDENSED VAPOR. THE DUCT SHOULD BE SLOPED BACK TO THE UNIT AND DRIP LEG(S) BE INSTALLED AT ANY LOW POINT(S).
8. CUSTOMER MUST BE SURE THAT MACHINE STANDS ON A NON-COMBUSTIBLE FLOOR.
9. MAXIMUM OPERATING WEIGHT OF WASHER (WITH ALL OPTIONS) IS 9800 LBS (4455 KG).
10. THIS EQUIPMENT IS DESIGNED TO GIVE OPTIMAL RESULTS IN AN ENVIRONMENT WHERE MAXIMUM RELATIVE HUMIDITY IS 80% FOR TEMPERATURE UP TO 88°F (31°C), DECREASING LINEARLY TO 50% RELATIVE HUMIDITY AT 104°F (40°C).
11. WEIGHTED EQUIVALENT SURFACE SOUND PRESSURE LEVEL: 83 dB(A) CALCULATED AS DESCRIBED IN ISO 3746
12. STERIS RECOMMENDS ILLUMINATION OF THE SERVICE AREA ALONG WITH PROVISION OF A CONVENIENCE OUTLET FOR MAINTENANCE.
13. PROVIDE RECEIVING, DISTRIBUTION, AND STORAGE AREAS OF SUFFICIENT SIZE AND CAPACITY TO ACCOMMODATE CRATED EQUIPMENT. EQUIPEMENT COMPONENTS ARE SHIPPED DISASSEMBLED IN 3 CRATES (4 WITH OPTIONAL TANKS).
    CRATE A, B, AND C: 49" W x 83"H x 100"L (1245 x 2108 x 2540 mm) EACH,
    MAXIMUM WEIGHT 2550 LBS (1157 Kg) EACH.
    OPTIONAL TANKS: 49"W x 54"H x 97"L (1245 x 1372 x 2464 mm),
    WEIGHT 1008 LBS (457 KG).
14. ANCHOR BOLTS (4 PLACES) 1" DIA. [25 mm] RED HEAD WEDGE ANCHOR (EMBEDDED 7 3/8" [72 mm]).

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DWN. M.Js	CKD. MfC	CKD.	ENG. YTF
DATE 2007-06-19	DATE 2008-03-31	DATE 08/03/31	DATE 2008/03/31

TITLE: BASIL® 4700 CAGE AND RACK WASHER EQUIPEMENT DRAWING

DWG. NO. 920-509-921 SHEET 2 OF 3

AUTOCAD DWG.

DISTRIBUTION: Intranet

DWG. NO.	920-509-921	SHEET OF 3

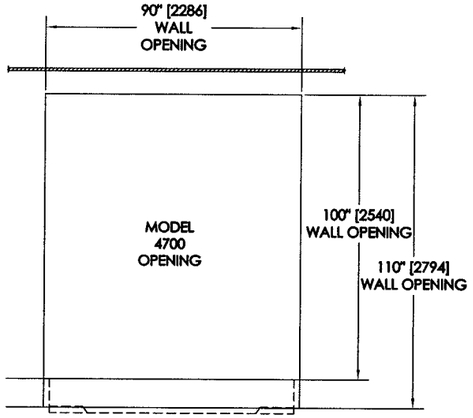
ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-441	2.1	2008-02-05

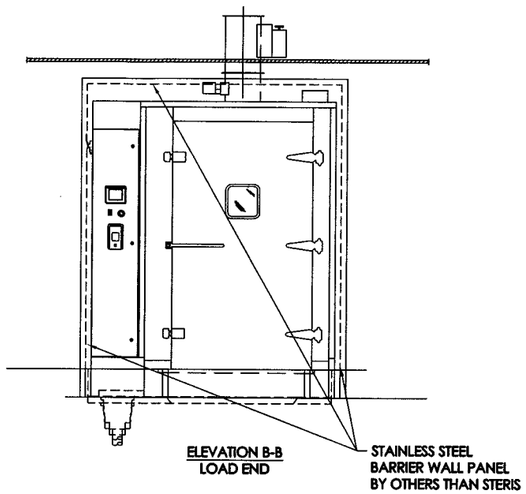
PIT DETAIL

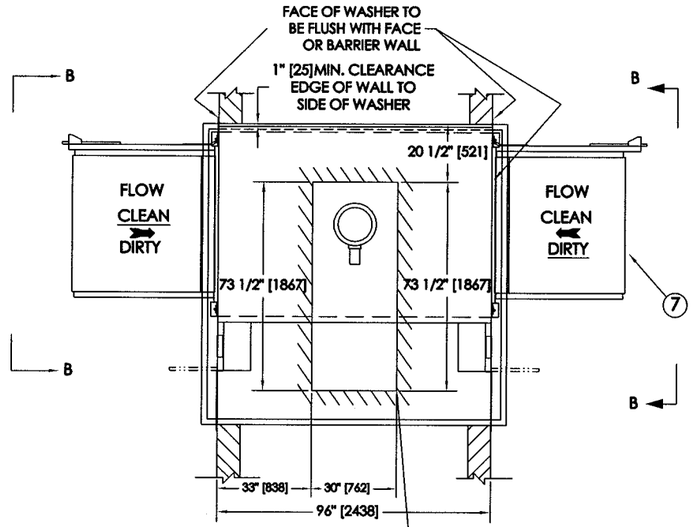
(I) 12 [305] x 12 [305] x 1/4 [6]
STAINLESS STEEL PLATE-(4) REQUIRED.
(NOTES 1 AND 4)

(II) 2 [51] x 2 [51] x 3/16 [5]
STAINLESS STEEL ANGLE AROUND PERIMETER OF PIT.
(NOTES 1 AND 2)

(III) 12 [305] x 12 [305] x 8 [203]
FLOOR SINK WITH 3 [76] DRAIN PIPE. PLATE TO HAVE
3 3/4 [95]Ø HOLE CENTERED ON DRAIN. (NOTE 1)







PIT DIMENSIONS

LF	103 [2616]
LG	28 1/2 [546]
LH	3 1/2 [890]
LI	2 1/8 [54]

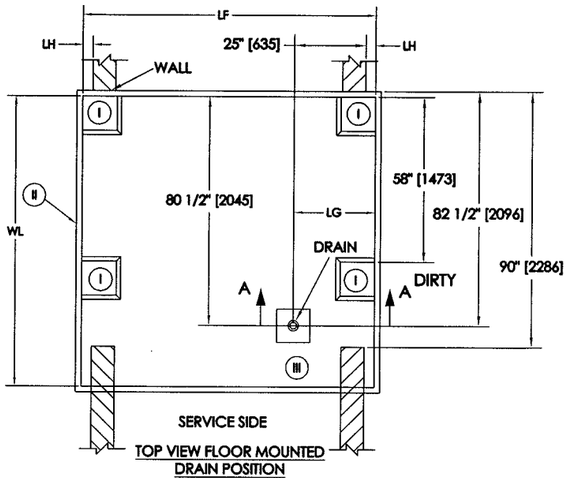
	1 TANK	2 TANKS	3 TANKS
WL	102 [2591]	102 [2591]	117 [2972]
WL	88 [2235] NO TANK		

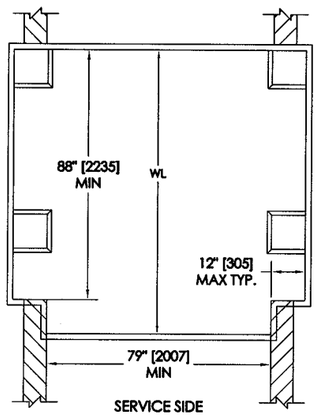
NOTES:
1- ALL MATERIAL (INCLUDING CONCRETE, CONCRETE PADS, STAINLESS STEEL PLATES, STAINLESS STEEL ANGLES, FLOOR SINK) AND LABOR FOR CONSTRUCTION OF PIT TO BE BY OTHERS THAN STERIS.

2- STAINLESS STEEL ANGLES ARE RECOMMENDED BY STERIS BUT ARE NOT NECESSARY FOR WASHER INSTALLATION.

3- SLOPE PIT FLOOR TO DRAIN.

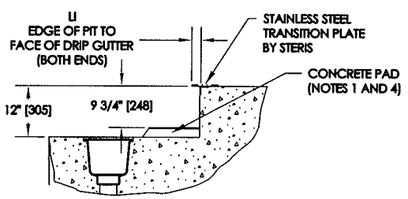
4- GROUT AND LEVEL ALL STAINLESS STEEL PLATES IN PLACE.





ALTERNATE PIT CONFIGURATION

SECTION A-A



LEFT HAND, FLOOR MOUNTED

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TITLE
BASIL®4700
CAGE AND RACK WASHER
EQUIPEMENT DRAWING

DWN. MJs	CKD. MHC	CKD.	ENG. YHF
DATE 2007-06-19	DATE 2008-05-31	DATE 2008/05/31	DATE 2008-05-31

DWG. NO. 920-509-921 SHEET OF 3

DISTRIBUTION: Intranet

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-441	2.1	2008-02-05

PIT DETAIL

(I) 12 [305] x 12 [305] x 1/4 [6]
STAINLESS STEEL PLATE-(4) REQUIRED.
(NOTES 1 AND 4)

(II) 2 [51] x 2 [51] x 3/16 [5]
STAINLESS STEEL ANGLE AROUND PERIMETER OF PIT.
(NOTES 1 AND 2)

(III) 12 [305] x 12 [305] x 8 [203]
FLOOR SINK WITH 3 [76] DRAIN PIPE. PLATE TO HAVE 3 3/4 [95]Ø HOLE CENTERED ON DRAIN. (NOTE 1)

PIT DIMENSIONS

LF	103 [2616]
LG	28 1/2 [546]
LH	3 1/2 [890]
LI	2 1/8 [54]

	1 TANK	2 TANKS	3 TANKS
WL	102 [2591]	102 [2591]	117 [2972]
WL	88 [2235] NO TANK		

NOTES:
1- ALL MATERIAL (INCLUDING CONCRETE, CONCRETE PADS, STAINLESS STEEL PLATES, STAINLESS STEEL ANGLES, FLOOR SINK) AND LABOR FOR CONSTRUCTION OF PIT TO BE BY OTHERS THAN STERIS.

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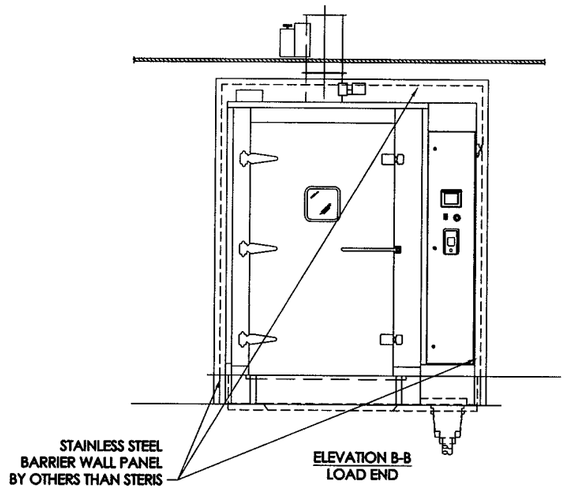
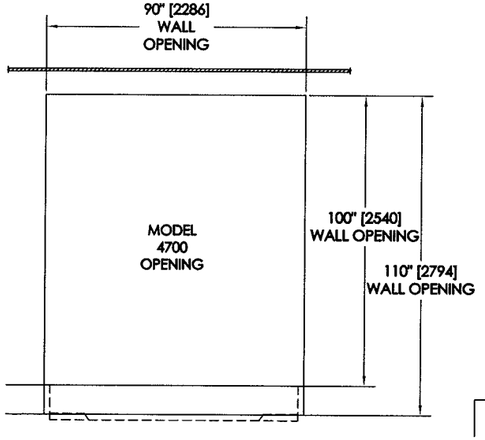
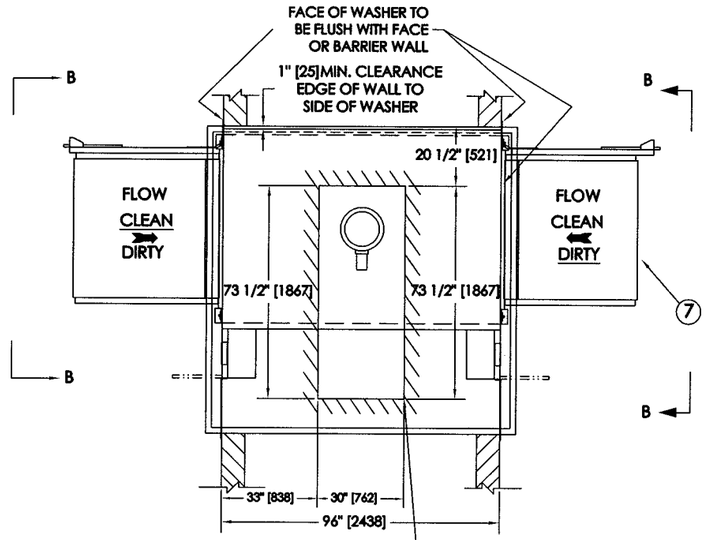
3- SLOPE PIT FLOOR TO DRAIN.

4- GROUT AND LEVEL ALL STAINLESS STEEL PLATES IN PLACE.

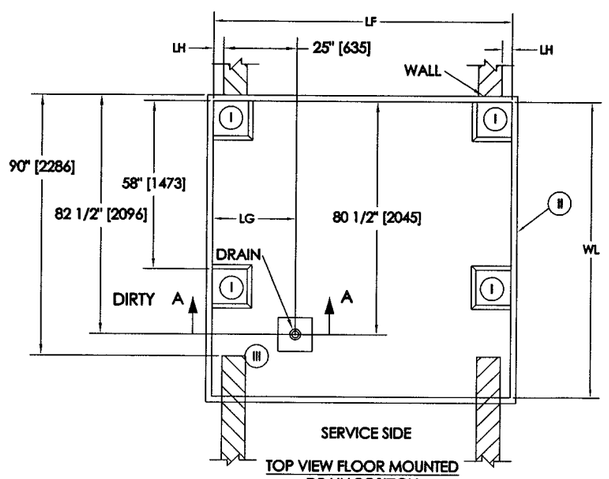


ELEVATION B-B
LOAD END

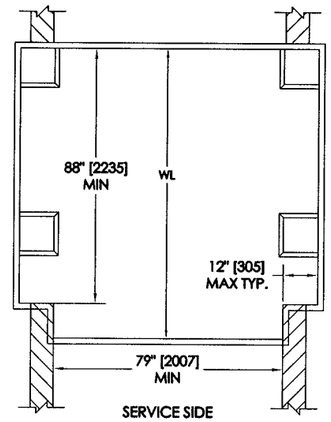




OPENING IN CEILING TO
ALLOW ACCESS TO AUTOMATIC
DAMPER ASSEMBLY WITH
REMOVABLE SERVICE PANEL
BY OTHERS THAN STERIS
(IF CEILING HEIGHT IS 124" OR LESS)

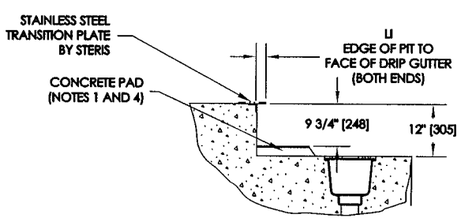


TOP VIEW FLOOR MOUNTED
DRAIN POSITION



ALTERNATE PIT CONFIGURATION

SECTION A-A



RIGHT HAND, FLOOR MOUNTED

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DWN. MJs	CKD. MFC	CKD.	ENG.
DATE 2007-06-19	DATE 2008-03-31	DATE 08/03/31	DATE 2008/03/31

TITLE: BASIL®4700 CAGE AND RACK WASHER EQUIPEMENT DRAWING

DWG. NO. 920-509-921 | 3 SHEET OF 3

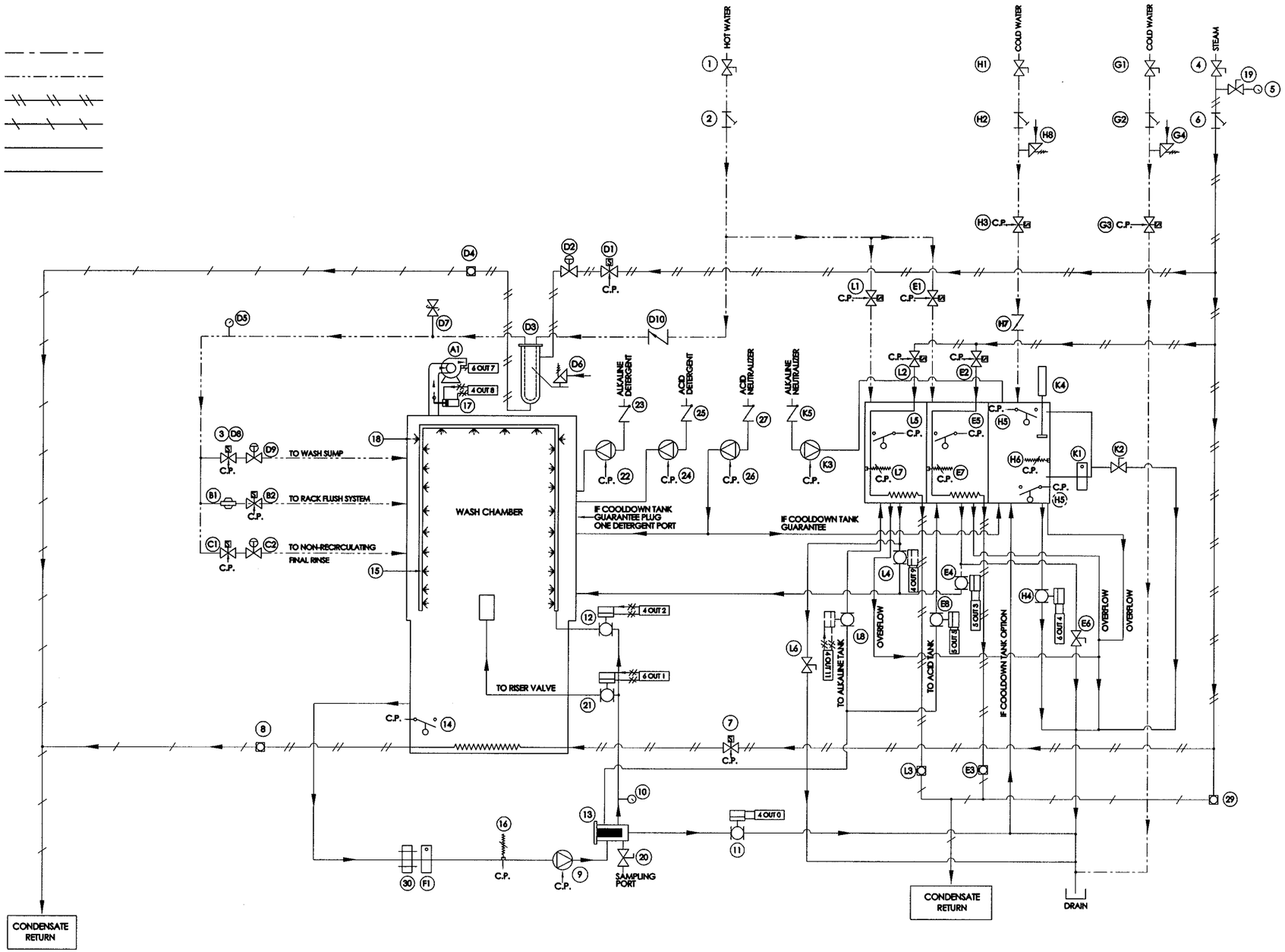
DISTRIBUTION: Intranet

ARCCAD DWG.

DWG. NO.	SHEET OF
920-510-019	1 OF 3

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS09-228	1.3	2008-07-03

COLD WATER
HOT WATER
STEAM
CONDENSATE
RECIRCULATION
DRAIN



OPTIONS PRESENT ON THE UNIT

DDCS WITH SIDE TANK & TEMPERATURE GUARANTEE (WS25-0036)

EXHAUST FAN (WS25-0015)

HEAT EXCHANGER (WS25-0003)

NON-RECIRCULATING FINAL RINSE (WS25-0022)

PH NEUTRALIZATION SYSTEM (WS25-0052) AND DDCS GUARANTEE (WS25-0036)

PH NEUTRALIZATION SYSTEM (WS25-0052)

OPTION WATER RACK FLUSH (WS25-0025)

OPTION REUSEABLE THROWAWAY ACID DET TANK (WS25-0013)

OPTION REUSEABLE THROWAWAY ALKALINE DET TANK (WS25-0063)

Project: _____
EQUIP#: _____
S/N: _____
CUST. PO#: _____
STERIS PO#: _____

☒ for information only
☐ for approval
by: SIGNHERE
date: 08/07/03
☐ certified for construction
by: _____
date: _____
☐ certified as built
by: _____
date: _____

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DWN.	CKD.	CKD.	ENG.
M.Js	MHC		SG
DATE 2007-07-10	DATE 2008-07-03	DATE 2008/07/03	DATE 08/07/03

TITLE
BASIL®4700
CAGE AND RACK WASHER
Process & Instrument Diagram

DWG. NO. 920-510-019 | SHEET 1 OF 3

DISTRIBUTION: Intranet

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS09-228	1.3	2008-07-03

BASE UNIT

REF. NO.	PART NO.	PART NAME	SPECIFICATION	VENDOR INFORMATION	QTY.	
1	117-941-001	MANUAL BALL VALVE	1" NPT, BRASS	JAMESBURY, 351 SERIES	1	
2	117-950-205	STRAINER	1" NPT, BRONZE	HONEYWELL, # FY32T1021	1	
❋ 3	117-903-825	WATER SOLENOID VALVE	1" NPT, BRASS CONNEC.	ASCO, # SC8210G4	1	
4	117-940-025	MANUAL BALL VALVE	1 1/2" NPT, BRASS	JAMESBURY, 351 SERIES	1	
5	117-959-340	PRESSURE GAGE	1/4" NPT, BRASS, 0-100 PSI, 2 1/2"ø	WINTERS, MODEL 100-4	1	
6	117-950-192	STRAINER	1 1/2" NPT, BRONZE	APOLLO, #59007-C1 80 MESH	1	
7	117-903-823	STEAM SOLENOID VALVE	1" NPT, BRASS CONNEC	ASCO, # SU8220G25	1	
8	117-950-198	STEAM TRAP	1" NPT, S/S	SPIRAX SARCO, MODEL TD52	1	
9	117-943-319	PUMP (208/460V)	10 HP, S/S, 5.6 IMP 3x2x6, 215JM FRAME	FLOWSERVE, #D-824, (9H) WITH LEFT HAND UNIT	1	
	117-943-317	PUMP (208/460V)	10 HP, S/S, 5.6 IMP 3x2x6, 215JM FRAME	FLOWSERVE, #D-824 (3H) WITH RIGHT HAND UNIT	1	
10	117-909-801	PRESSURE GAGE	1/4" NPT, BRASS, 0-60 PSI	FOSTER, # 025FFS00200	1	
11	117-909-604	PNEUMATIC BALL VALVE ASS'Y	1" Tri-Clamp, S/S	JAMESBURY	1	(*)
12	117-997-591	PNEUMATIC BALL VALVE ASS'Y	2" Tri-Clamp, S/S	JAMESBURY	1	(*)
13	117-940-292	SELF CLEANING SCREEN	S/S	STERIS	1	
14	117-903-117	SENSOR, WATER LEVEL	3/8"- 24, S/S	MADISON, #M-5010	1	(*)
15	117-941-437	SPRAY NOZZLE	3/8" NPT, S/S	JOHN BROOKS LIMITED (CDN), #3/8PJB5040	40	
16	117-955-383	RTD SINGLE ELEMENT,100 OHMS	1/8" NPT, S/S	QUANTEM, # 223-11210-1	1	
17	117-911-709	AIR CYLINDER	1/8" NPT, ALUMINIUM	BIMBA, # D-81140-A	1	
18	117-940-055	SPRAY NOZZLE	1/4" NPT, S/S	JOHN BROOKS LIMITED (CDN), #1/4USJB9550	4	
19	117-940-083	MANUAL BALL VALVE	1/4" NPT, BRASS	JAMESBURY, 351 SERIES	1	
20	117-943-286	MANUAL BALL VALVE	3/8" NPT, S/S	WATTS, SERIES S-FVB, 548011	1	
21	117-997-590	PNEUMATIC BALL VALVE ASS'Y	1 1/2" Tri-Clamp, S/S	JAMESBURRY	1	(*)
22	117-905-727	PUMP	PERISTALTIC	KNIGHT, # KP81208X	1	(*)
23	117-908-973	CHECK VALVE	CHECK VALVE FOR POLIFLO 3/8"Ø	KNIGHT, # 2201225	1	
24	117-905-727	PUMP	PERISTALTIC	KNIGHT, # KP81208X	1	(*)
25	117-908-973	CHECK VALVE	CHECK VALVE FOR POLIFLO 3/8"Ø	KNIGHT, # 2201225	1	
26	117-905-727	PUMP	PERISTALTIC	KNIGHT, # KP81208X	1	(*)
27	117-908-973	CHECK VALVE	CHECK VALVE FOR POLIFLO 3/8"Ø	KNIGHT, # 2201225	1	
29	117-950-182	STEAM TRAP	1/2" NPT, S/S	SPIRAX SARCO, MODEL TD52	1	
30	117-913-069	CONDUCTUVITY PROBE	3/4" NPT, PVDF, 0-93°C, 200µ-500m S/CM	THORNTON, #244-630	1	
31	117-915-032	AIR CYLINDER	1/8" NPT, ALUMINIUM	BIMBA, # FO-09-1 1/16-4R	1	
32	117-915-032	AIR CYLINDER	1/8" NPT, ALUMINIUM	BIMBA, # FO-09-1 1/16-4R	1	

EXHAUST FAN (WS25-0015)

REF. NO.	PART NO.	PART NAME	SPECIFICATION	VENDOR INFORMATION	QTY.
A1	117-940-112	FAN	1/3 HP, 12"ø, 2427 FAN RPM	CINCINNATI, MODEL WAF, # 12-4-30	1

AUTOMATIC WATER RACK FLUSH SYSTEM FOR TWO RACKS (WS25-0025)

REF. NO.	PART NO.	PART NAME	SPECIFICATION	VENDOR INFORMATION	QTY.
B1	117-940-084	WATER REGULATOR	3/4" NPT, BRASS	WATTS, # U-5	1
B2	117-956-361	STEAM SOLENOID VALVE	3/4" NPT, BRASS CONNEC	ASCO, # SU8220G23	1
NOT SHOWN	117-940-137	QUICK DISCONNECT (F)	1/4" NPT, S/S	FOSTER, # 3003S/S	2
NOT SHOWN	117-940-138	QUICK DISCONNECT (F)	1/4" NPT, S/S	FOSTER, # 3103S/S	2
NOT SHOWN	117-943-312	QUICK DISCONNECT (M)	1/4" NPT, S/S	FOSTER, # 11-3S/S	2

NON-RECIRCULATING FINAL RINSE (WS25-0022)

REF. NO.	PART NO.	PART NAME	SPECIFICATION	VENDOR INFORMATION	QTY.
C1	117-903-823	STEAM SOLENOID VALVE	1" NPT, BRASS CONNEC	ASCO, # SU8220G25	1
C2	117-950-220	GLOBE VALVE	1" NPT, BRONZE	CRANE, CLASS 150, # 7TF	1
NOT SHOWN	117-940-052	SPRAY NOZZLE	1/4" NPT, S/S	JOHN BROOKS LIMITED (CDN), #1/4USJB8020	28
NOT SHOWN	117-915-193	SPRAY NOZZLE	1/4" NPT, S/S	JOHN BROOKS LIMITED (CDN), #1/8USJB8020	4

HEAT EXCHANGER TO RAISE WATER TEMPERATURE 50-80°F (WS25-0003)

REF. NO.	PART NO.	PART NAME	SPECIFICATION	VENDOR INFORMATION	QTY.
D1	117-903-824	STEAM SOLENOID VALVE	1 1/2" NPT, BRASS CONNEC	ASCO, # SU8220G29	1
D2	117-940-075	GLOBE VALVE	1 1/2" NPT, BRONZE	CRANE, CLASS 150, # 7TF	1
D3	117-940-121	HEAT EXCHANGER	2 1/2" NPT INLET, VERTICAL MOUNT	BELL & GOSSETT TYPE "SU", # QSU64-4	1
D4	117-950-198	STEAM TRAP	1" NPT, S/S	SPIRAX SARCO, MODEL TD52	1
D5	117-940-122	THERMOMETER	1/2" NPT, 0-250°F	TREND, # 33040	1
D6	117-940-073	VACUUM BREAKER	1/2" NPT, BRASS	SPIRAX SARCO, MODEL VB-14	1
D7	117-940-074	PRESSURE RELIEF VALVE	3/4" NPT, BRONZE, 30-125 PSI	WATTS, SERIES 174A, MODEL M3	1
D8	117-903-823	STEAM SOLENOID VALVE	1" NPT, BRASS CONNEC	ASCO, # SU8220G25	1
D9	117-950-220	GLOBE VALVE	1" NPT, BRONZE	CRANE, CLASS 150, # 7TF	1
D10	117-940-076	CHECK VALVE	1" NPT,BRONZE	WATTS 125 WSP 200 WOG	1

❋ D8 IS USED INSTEAD IF OPTION WS25-0003 (HEAT EXCHANGER TO RAISE WATER TEMPERATURE 50-80°F) IS ORDERED.

OPTION REUSEABLE THROWAWAY ACID DET TANK (WS25-0013)

E1	117-904-297	WATER SOLENOID VALVE	3/4" NPT, BRASS CONNEC	ASCO, # SC8210G3	1	
E2	117-956-361	STEAM SOLENOID VALVE	3/4" NPT, BRASS CONNEC	ASCO, # SU8220G23	1	
E3	117-950-360	STEAM TRAP	3/4" NPT, S/S	SPIRAX SARCO, MODEL TD52	1	
E4	117-997-590	PNEUMATIC BALL VALVE ASS'Y	1 1/2" Tri-Clamp, S/S	JAMESBURY	1	(*)
E5	117-903-117	SENSOR, WATER LEVEL	3/8"- 24, S/S	MADISON, #M-5010	1	(*)
E6	117-041-746	MANUAL BALL VALVE	1 1/2" NPT, S/S	TRY-CANADA SS-15	1	
E7	117-955-383	RTD SINGLE ELEMENT,100 OHMS	1/8" NPT, S/S	QUANTEM, # 223-11210-1	1	
E8	117-909-604	PNEUMATIC BALL VALVE ASS'Y	1" Tri-Clamp, S/S	JAMESBURY	1	(*)

(*) PART MODIFIED BY STERIS

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DWN. M.Js	CKD. MAC	CKD. SJ	ENG. SG
DATE 2007-07-10	DATE 2008-07-03	DATE 2008-07-03	DATE 08/07/03

TITLE: BASIL®4700 CAGE AND RACK WASHER

Process & Instrument Diagram

DWG. NO. 920-510-019 | SHEET 2 OF 3

DISTRIBUTION: Intranet

ARCCAD DWG.

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS09-228	1.3	2008-07-03

pH NEUTRALIZATION SYSTEM (WS25-0052)

REF. NO.	PART NO.	PART NAME	SPECIFICATION	VENDOR INFORMATION	QTY.
F1	117-909-559	pH PROBE	3/4" NPT, PVDF, 0-100°C 0-12 pH	THORNTON, # 363-132	1

DRAIN DISCHARGE COOLDOWN SYSTEM WITH COLD WATER INJECTION ONLY (BASE UNIT)

REF. NO.	PART NO.	PART NAME	SPECIFICATION	VENDOR INFORMATION	QTY.
G1	117-940-025	MANUAL BALL VALVE	1 1/2" NPT, BRASS	JAMESBURY, 351 SERIES	1
G2	117-942-897	STRAINER	1 1/2" NPT, BRONZE	HONEYWELL, # FY32T1088	1
G3	117-910-055	WATER SOLENOID VALVE	1 1/2" NPT, BRASS CONNEC	ASCO, # SC8210G22	1
G4	117-951-541	BREAKER VACUUM	1/2" NPT, BRASS CONNEC	WATTS, MODEL # N36-M1	1

DRAIN DISCHARGE COOLDOWN SYSTEM WITH SIDE TANK & TEMPERATURE GUARANTEE (WS25-0036)

REF. NO.	PART NO.	PART NAME	SPECIFICATION	VENDOR INFORMATION	QTY.	
H1	117-941-001	MANUAL BALL VALVE	1" NPT, BRASS	JAMESBURY, 351 SERIES	1	
H2	117-950-205	STRAINER	1" NPT, BRONZE	HONEYWELL, # FY32T1021	1	
H3	117-903-825	WATER SOLENOID VALVE	1" NPT, BRASS CONNEC	ASCO, # SC8210G4	1	
H4	117-997-590	PNEUMATIC BALL VALVE	1 1/2" Tri-Clamp, S/S	JAMESBURY	1	(*)
H5	117-903-117	SENSOR, WATER LEVEL	3/8"-24, S/S	MADISON, #M-5010	2	(*)
H6	117-955-383	RTD SINGLE ELEMENT,100 OHMS	1/8" NPT, S/S	QUANTEM, #223-11210-1	1	
H7	117-940-051	CHECK VALVE,	1"NPT S/S	SHARPE #20276	1	
H8	117-951-541	BREAKER VACUUM	1/2"NPT, BRASS CONNEC	WATTS, MODEL # N36-M1	1	

PNEUMATIC VALVE

REF. NO.	PART NO.	PART NAME	SPECIFICATION	VENDOR INFORMATION	QTY.
J1	117-915-078	FILTER/REGULATOR AND GAGE	3/8" HOSE, 5-125 PSI	FESTO # 539685	1
J2	117-915-010	AIR SOLENOID VALVE	1/8" SINGLE SOLENOID	FESTO # MEBH -5/2-5.0-B-110-AC	11
J3	117-902-318	Micrometric Valve	1/8"M X 1/4" OD	COWPER INC #FQP2	2

PH NEUTRALIZATION SYSTEM (WS25-0052) WITH SIDE TANK & TEMPERATURE GUARANTEE (WS25-0036)

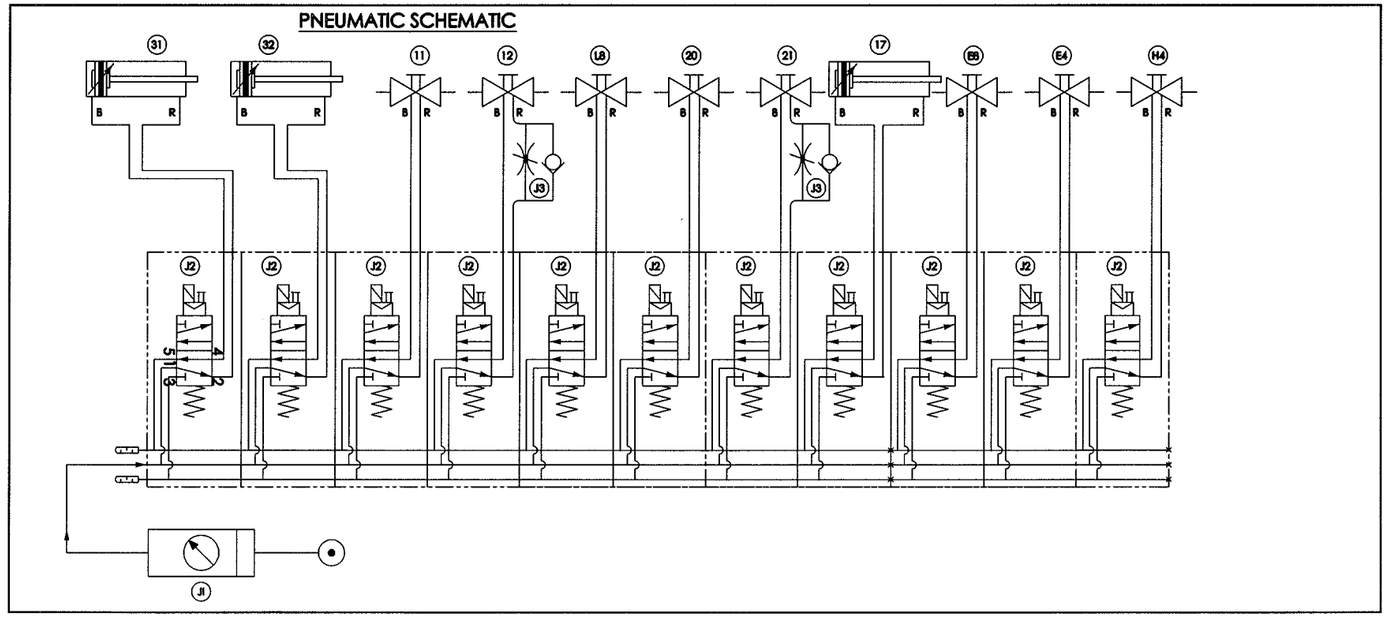
REF. NO.	PART NO.	PART NAME	SPECIFICATION	VENDOR INFORMATION	QTY.	
K1	117-909-559	pH PROBE	3/4" NPT, PVDF, 0-100°C 0-12 pH	THORNTON, # 363-132	1	
K2	117-914-331	MANUAL BALL VALVE	3/4" NPT S/S	JAMESBURY # 3/4" 9FB-3600TTB	1	
K3	117-905-727	PUMP	PERISTALTIC	KNIGHT, # KP8120BX	1	(*)
K4	117-940-151	MIXER	1/3 HP, 115V, BRACKET MOUNT, 1725 RPM, TOTALLY ENCLOSED	CHEM EXPERTS (PULSAFEEDER), # 42730-8-TEH	1	
K5	117-908-973	CHECK VALVE	CHECK VALVE FOR POLIFLO 3/8"Ø	KNIGHT, # 2201225	1	

OPTION REUSEABLE THROWAWAY ALKALINE DET TANK (WS25-0063)

L1	117-904-297	WATER SOLENOID VALVE	3/4" NPT, BRASS CONNEC	ASCO, # SC8210G3	1	
L2	117-956-361	STEAM SOLENOID VALVE	3/4" NPT, BRASS CONNEC	ASCO, # SU8220G23	1	
L3	117-950-360	STEAM TRAP	3/4" NPT, S/S	SPIRAX SARCO, MODEL TD52	1	
L4	117-997-590	PNEUMATIC BALL VALVE ASS'Y	1 1/2" Tri-Clamp, S/S	JAMESBURY	1	(*)
L5	117-903-117	SENSOR, WATER LEVEL	3/8"- 24, S/S	MADISON, #M-5010	1	(*)
L6	117-041-746	MANUAL BALL VALVE	1 1/2" NPT, S/S	TRY-CANADA SS-15	1	
L7	117-955-383	RTD SINGLE ELEMENT,100 OHMS	1/8" NPT, S/S	QUANTEM, # 223-11210-1	1	
L8	117-909-604	PNEUMATIC BALL VALVE ASS'Y	1" Tri-Clamp, S/S	JAMESBURY	1	(*)

(*) PART MODIFIED BY STERIS

PNEUMATIC SCHEMATIC



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DWN. MJs	CKD. MFC	CKD. SF	ENG.
DATE 2007-07-10	DATE 2008-07-03	DATE 2008/07/03	DATE 2008/07/03

TITLE: BASIL®4700 CAGE AND RACK WASHER

Process & Instrument Diagram

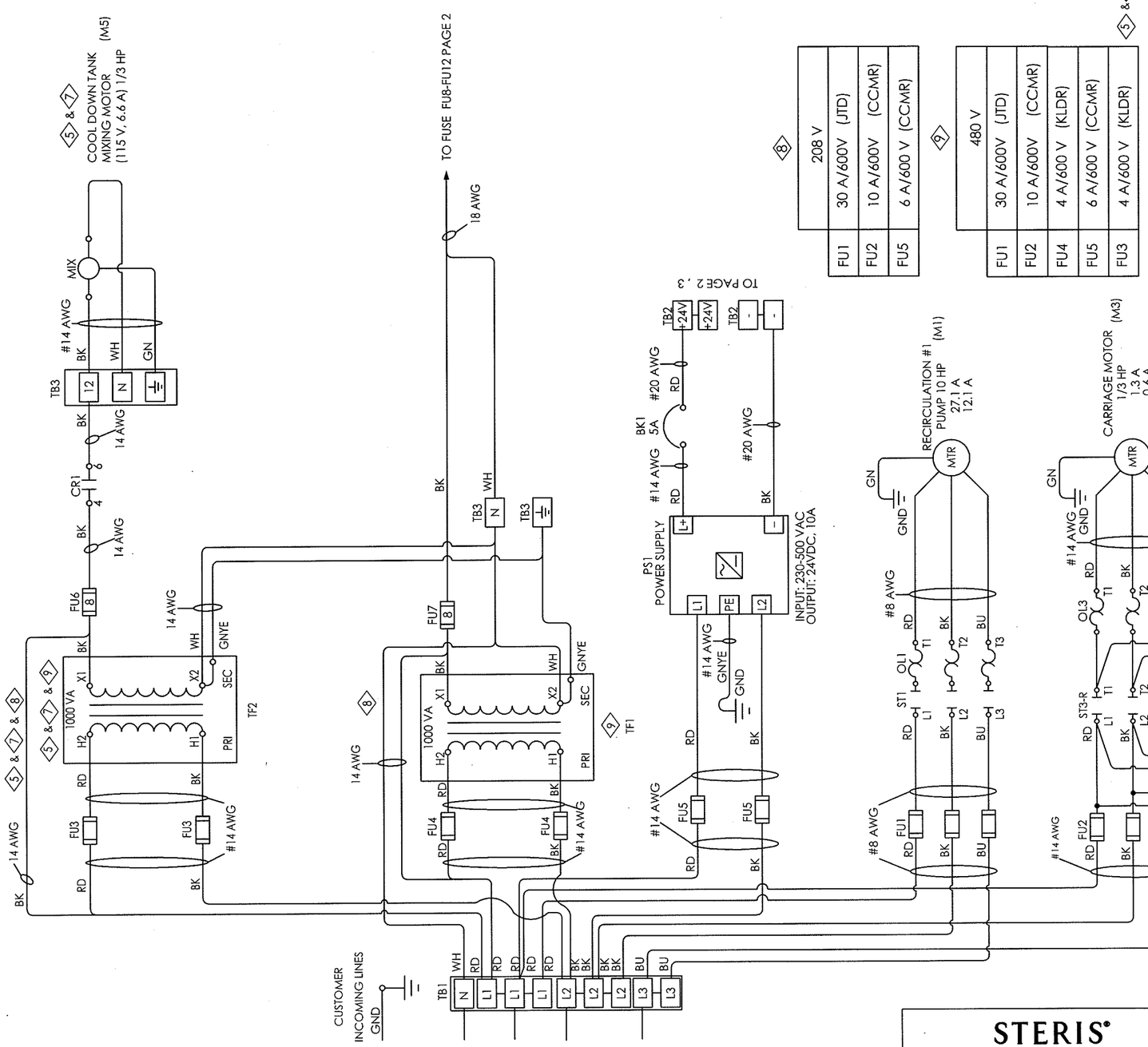
DWG. NO. 920-510-019 | SHEET 3 OF 3

DISTRIBUTION: Intranet

AUTOCAD DWG.

DWG. NO.	SHEET OF
920-509-795	1 OF 11

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-641,DCTAS09-266 & 281.	4.0	2008-07-14



208 V	
FU1	30 A/600V (JTD)
FU2	10 A/600V (CCMR)
FU5	6 A/600 V (CCMR)

480 V	
FU1	30 A/600V (JTD)
FU2	10 A/600V (CCMR)
FU4	4 A/600 V (KLDR)
FU5	6 A/600 V (CCMR)
FU3	4 A/600 V (KLDR)

Project: _____
EQUIP #: _____
S/N: _____
CUST. PO #: _____
STERIS PO #: _____

☒ for information only
☐ for approval
by: S Gilmore 08/07/17
date: _____
☐ certified for construction
by: _____
date: _____
☐ certified as built
by: _____
date: _____

OPTIONS

1	N/A (WS25-0003) HEAT EXCHANGER TO RAISE WATER TEMPERATURE
2	N/A (WS25-0015) EXHAUST FAN
3	N/A (WS25-0022) NON-RECIRCULATING FINAL RINSE
4	N/A (WS25-0025) AUTOMATIC WATER RACK FLUSH SYST FOR 2 RACK
5	N/A (WS25-0036) DDCS WITH SIDE TANK AND TEMP. GAR.
6	N/A (WS25-0013) REUSEABLE THROWAWAY ACID DETERGENT SYS.
7	N/A (WS25-0052) PH NEUTRALIZATION AND DET MONITORING SYSTEM
8	N/A (WS32-2_1) 208 VOLTS
9	N/A (WS32-2_3) 480 VOLTS
10	N/A (WS25-0063) REUSEABLE THROWAWAY ALKALINE DETERGENT SYS.
11	N/A (WS25-0049) IMPACT PRINTER

DRY CONTACTS FOR CUSTOMER USE

CR10 — AUTOMATIC DAMPER CONTACT
CR11 — EXHAUST FAN CONTACT

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DWN. SV	CKD.	CKD.	ENG.
DATE 2007-07-01	DATE 7/06/07/14	DATE 08/07/16.	DATE 08/07/17

TITLE: BASIL® 4700 CAGE AND RACK WASHER ELECTRICAL SCHEMATIC

DWG. NO. 920-509-795 — 1 SHEET OF 11

AUTOCAD DWG.

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-641,DCTAS09-266 & 281.	4.0	2008-07-14

DWG. NO. 920-509-795 | SHEET 2 OF 11

FROM PAGE 1, 24VDC (POWER SUPPLY PS1)

MCR 13 14

TB2 4 — MCR — TB2 +24V — RD

EMERGENCY CABLE (EC)

EC-2 — WH — 21 — 22 — BK — EC-1

TO INPUT IN0 EMERGENCY CABLE SEE PAGE 4 — RD

TO INPUT IN1 EMERGENCY STOP PRESSED ON UNLOAD END SEE PAGE 4 — RD

TO INPUT IN2 EMERGENCY STOP PRESSED ON LOAD END SEE PAGE 4 — RD

TO INPUT IN3 WASHER LOCK SEE PAGE 4 — RD

TB2 3 — RD — PB2-2 — RD — 32 — 31 — BK — PB2-1 — BK — TB2 2

PB2 EMERGENCY STOP UNLOAD

LOCATED IN UNLOAD SIDE PANEL

TB2 — WH — 32 — 31 — BK — WH

PB1 EMERGENCY STOP LOAD

LOCATED IN LOAD SIDE PANEL

PB2-5 — WH — 14 — 13 — 22 — 21 — BU — TB2 1

LOAD SIDE KEY SWITCH UNLOCK LOCK RESET

PB2-4 — BU — 14 — 13 — 22 — 21 — BN — TB2 -

UNLOAD SIDE KEY SWITCH UNLOCK LOCK RESET

PB2-3 — BN — BN — TB2 -

TB2 5 — RD — CR6 — 1 — 0 — WH — WH — LOAD DOOR (LD)

TO INPUT IN4 LOAD DOOR (LD) SEE PAGE 4 — RD

TB2 +24V — RD — TB2 - — BK

TB2 6 — RD — CR7 — 1 — 0 — WH — WH — UNLOAD DOOR (UD)

TO INPUT IN5 UNLOAD DOOR (UD) SEE PAGE 4 — RD

TB2 +24V — RD — TB2 - — BK

TO CHEMICAL PUMPS PAGE 10 — BK — WH

TO POWER SUPPLY PS2 PAGE 3
TO POWER SUPPLY PS3 PAGE 8
TO MCR-34 PAGE 7
TO SW3 PAGE 7
TO SW4 PAGE 7 — BK — WH

TO PANEL VIEW LOAD SIDE PAGE 3 — BK — WH

TO PANEL VIEW UNLOAD SIDE PAGE 3 — BK — WH

TO THORNTON 2000 PAGE 6 — BK — WH — GNYE — GND

INTERIOR CABINET LIGHTS — WH — 2 — 1 — BK

TB3 13 — N

FROM PAGE 1 POWER SECTION — WH — BK

FU8 4 — FU9 4 — FU10 4 — FU11 4 — FU12 0.5

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DWN. SV	CKD.	CKD.	ENG.
DATE 2007-01-31	DATE 2008/07/16	DATE 08/07/16	DATE 08/07/17

TITLE: BASIL® 4700
CAGE AND RACK WASHER
ELECTRICAL SCHEMATIC

DWG. NO. 920-509-795 | SHEET 2 OF 11

AUTOCAD DWG.

DWG. NO.	SHEET OF
920-509-795	3 of 11

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-641,DCTAS09-266 & 281.	4.0	2008-07-14

POWER SUPPLY PS2

L1 120-240 VAC

PE

L2 COM

#14 AWG GNYE GND

WH

BK

FROM PAGE 2 POWER SECTION (FU9)

BACKPLANE SUPPLY INTERCONNECTIONS FOR SLOT 0,1,2 AND 3

CPU SLOT 0

14 AWG GNYE GND

GND

CHANNEL 0 RS232-1

P15 2 3 4 5 7 8

CHANNEL 1 RS232

P20 2 3 4 5 7 8

P21 BK 2 RD 3 BN 4 GN 5 BU 7 WH 8

P16 2 BK 3 RD 4 BN 5 GN 7 BU 8 WH

P17 2 RX 3 TX 4 DTR 5 GND DSR 7 RTS 8 CTS

DB9 RS232

120 / 240 V 60VA MAX

P13 7 WH 2 BK 3 RD

NULL MODEM

DB25 RS-232 COM TXD RXD

INTERNAL PRINTER

SUPPLY 1 GND 2 3 4 24VDC

P11 7 WH 3 RD 2 BK

RS 232 EXTERNAL DB9

BK RD

TB2 - TB2 +24V

1

FROM PAGE 1, 24VDC (POWER SUPPLY PS1)

P10 2 BK 3 RD 4 5 WH 6 7 8

RX TX DTR GND DSR RTS CTS

DB9 RS232-2

EXTENSION MODULE

P14 2 3 4 5 GND 7 8

RX TX DTR GND DSR RTS CTS

DB9 RS232-1

PANEL VIEW LOAD SIDE

L1 L2/NEUTRAL

RJ45 LAN ETHERNET

GNYE #14 AWG GND

RJ45 LAN

120 / 240 V 60VA MAX

FROM PAGE 2 POWER SECTION (FU10)

BK WH

PANEL VIEW UNLOAD SIDE

L1 L2/NEUTRAL

BK WH GNYE #14 AWG GND

WH

TO PAGE 9 NEUTRAL OF BUZZER

FROM PAGE 2 POWER SECTION (FU11)

BK P8-1 WH P8-2 GN P8-4 GN GND

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DWN. SV	CKD.	CKD.	ENG.
DATE 2007-01-31	DATE 2008/07/16	DATE 08/07/16	DATE 08/09/17

TITLE

BASIL® 4700 CAGE AND RACK WASHER ELECTRICAL SCHEMATIC

DWG. NO. 920-509-795 | 3 of 11

AUTOCAD DWG.

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-641,DCTAS09-266 & 281.	4.0	2008-07-14

DWG. NO. 920-509-795 | SHEET 4 OF 11

DIGITAL INPUT SOURCING
SLOT 1

14 AWG GNYE — GND — GND

DCCOM 1	DCCOM 2	IN 0	IN1	IN2	IN3	IN4	IN5	IN6	IN7	IN8	IN9	IN10	IN11	IN12	IN13	IN14	IN15						
+24 VDC	+24 VDC	EMERGENCY CABLE	UNLOAD SIDE EMERGENCY STOP BUTTON	LOAD SIDE EMERGENCY STOP BUTTON	WASHER LOCK	LOAD DOOR SWITCH	UNLOAD DOOR SWITCH	CARRIAGE FORWARD SENSOR (LOAD)	CARRIAGE REVERSE SENSOR (UNLOAD)	SUMP LEVEL	ALKALINE TANK NOT USED	ACID TANK NOT USED	COOLDOWN TANK HIGH LEVEL NOT USED	COOLDOWN TANK LOW LEVEL NOT USED	NOT USED	NOT USED	NOT USED						
RD	RD	RD	RD	RD	RD	RD	RD	BK	BK	BK	WH	BN	BU	OG									

CABLE 20/7 AWG

TB2 +24V

TB2 7 — WH — BK — SL — BK — BK — TB2 -

TB2 8 — WH — BK — TL — BK — BK — TB2 - — 10

TB2 9 — WH — BK — TH — BK — BK — TB2 - — 6

TB2 10 — WH — BK — CH — BK — BK — TB2 - — 5

TB2 11 — WH — BK — CL — BK — BK — TB2 - — 5

CR8 11 14 — BK — TB2 -

CR9 11 14 — BK — TB2 -

FROM PAGE 2 EMERGENCY CABLE

FROM PAGE 2 UNLOAD SIDE EMERGENCY STOP BUTTON (PB2)

FROM PAGE 2 LOAD SIDE EMERGENCY STOP BUTTON (PB1)

FROM PAGE 2 WASHER LOCK

FROM PAGE 2 LOAD DOOR SWITCH (LD)

FROM PAGE 2 UNLOAD DOOR SWITCH (UD)

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DWN. SV	CKD.	CKD.	ENG.
DATE 2007-01-31	DATE 2008/07/16	DATE 08/07/16	DATE 08/07/17

TITLE: BASIL® 4700 CAGE AND RACK WASHER ELECTRICAL SCHEMATIC

DWG. NO. 920-509-795 | SHEET 4 OF 11

A1OCA3.DWG

DWG. NO.	SHEET OF
920-509-795	5 OF 11

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-641,DCTAS09-266 & 281.	4.0	2008-07-14

ANALOG INPUTS MODULE RTD
SLOT 2

SUMP RTD
ALKALINE TANK RTD NOT USED
ACID TANK NOT USED RTD
COOLDOWN TANK NOT USED RTD

RTN 0 | SENSE 0 | EXC 0 | RTN 1 | SENSE 1 | EXC 1 | RTN 2 | SENSE 2 | EXC 2 | RTN 3 | SENSE 3 | EXC 3 | RTN 4 | SENSE 4 | EXC 4 | RTN 5 | SENSE 5 | EXC 5 | GND

14 AWG GNYE — GND

	WH	RD	BK	SH	
SUMP RTD	RTD0-3	RTD0-4	RTD0-2	RTD0-1	GND
◇10 ALKALINE TANK RTD	RTD1-3	RTD1-4	RTD1-2	RTD1-1	GND
◇6 ACID TANK RTD	RTD2-3	RTD2-4	RTD2-2	RTD2-1	GND
◇5 COOLDOWN TANK RTD	RTD3-3	RTD3-4	RTD3-2	RTD3-1	GND

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DWN. SV	CKD.	CKD.	ENG.
DATE 2007-01-31	DATE 2007/07/16	DATE 08/07/16	DATE 08/08/17

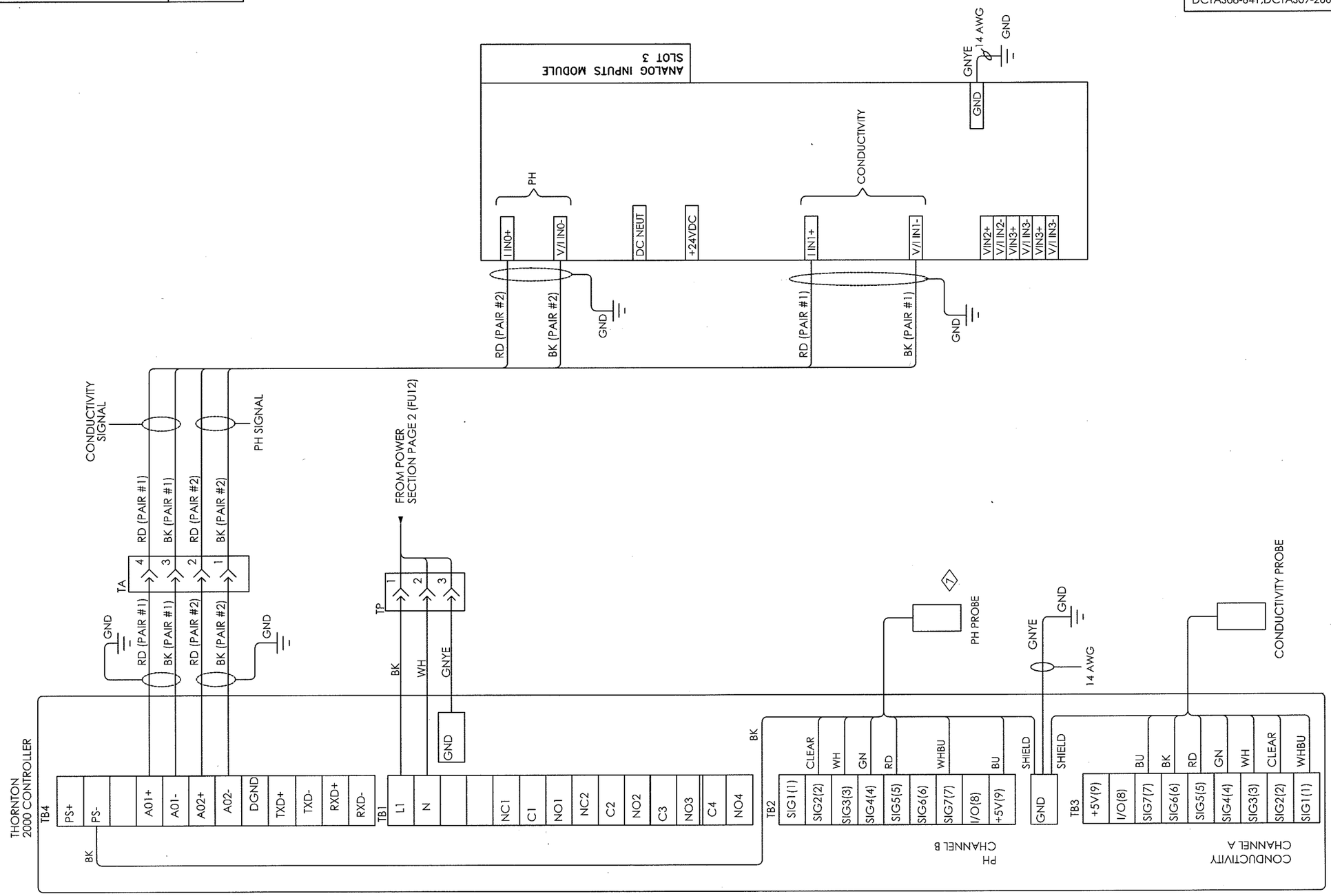
TITLE
BASIL® 4700
CAGE AND RACK WASHER
ELECTRICAL SCHEMATIC

DWG. NO. 920-509-795 | SHEET 5 OF 11

AUTOCAD DWG.

DWG. NO.	SHEET OF
920-509-795	6 / 11

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-641,DCTAS09-266 & 281.	4.0	2008-07-14



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DWN.	CKD.	CKD.	ENG.
SV			
DATE 2007-01-31	DATE 2008/02/16	DATE 08/02/16	DATE 08/02/17

TITLE

BASIL® 4700 CAGE AND RACK WASHER ELECTRICAL SCHEMATIC

DWG. NO. 920-509-795 | SHEET 6 OF 11

DWG. NO.	SHEET OF
920-509-795	7 OF 11

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-641,DCTAS09-266 & 281.	4.0	2008-07-14

TO PAGE 8

TO PAGE 10 PNEUMATIC VALVE

FROM PAGE 2 POWER SECTION (TB3-13 AND TB3-N)

WH, BK, RD

MCR 33 | 34

VAC 1 (RD) — VAC 2 (RD) — GND

OUTPUTS DIGITAL SLOT 4

OUT 0	OUT 1	OUT 2	OUT 3	OUT 4	OUT 5	OUT 6	OUT 7	OUT 8	OUT 9	OUT 10	OUT 11	OUT 12	OUT 13	OUT 14	OUT 15
SUMP DRAIN VALVE	SUMP FILL VALVE	JET VALVE	SUMP STEAM VALVE	RECIRCULATION PUMP	CARRIAGE FORWARD	CARRIAGE REVERSE	ALKALINE DETERGENT PUMP	DAMPER	NOT USED ALKALINE TANK DUMP VALVE	NOT USED ALKALINE TANK FILL VALVE	NOT USED ALKALINE TANK RETURN VALVE	NOT USED ALKALINE TANK STEAM VALVE	DRAIN COOLING VALVE COOLDOWN TANK FILL VALVE ◇10	HEAT EXCHANGER NOT USED STEAM VALVE ◇1	NOT USED
OG	BK	BU	RD	BK	BK	BK	BK	OG/BK	RD/BK	BN	WH/BK	BU	OG	YE	
	MCR 34	CR7 33	TB3 16	CR6 13	CR7 24	CR6 43				TB3 17	TB3 18	TB3 19	TB3 20		
		CR4 34	CABLE 20/12 AWG	CR7 14	CR6 24	CR7 44				CABLE 20/12 AWG	CABLE 20/12 AWG	CABLE 20/12 AWG	CABLE 20/12 AWG		
		BK 33		BK 13	BK 23	BK 43									

V1 V2 V3 V4 V5 V6 — WH — GNYE

ST1 — A2 / A1

ST3-F — A2 / A1 — BK — 22 / 21 — WH — 2

ST3-R — A2 / A1 — BK — 22 / 21 — WH — 2

CARRIAGE FORWARD (CF) CR8 — A2 / A1 — BK — 4

CARRIAGE BACKWARD (CR) CR9 — A2 / A1 — BK — 4

CR2 — A2 / A1

CR10 — A2 / A1

OL-3 — 96 / 95 — WH

OL1 — 96 / 95 — BK

SW3 — WH — 1 — RD — 3 — BN

SW4 — WH — 1 — RD — 3 — BN

TB3 N

SEE PAGE 2, FU9

SEE PAGE 2, FU9

0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15

STERIS®	STERIS Canada Corporation	TITLE	BASIL® 4700 CAGE AND RACK WASHER ELECTRICAL SCHEMATIC
DWN. SV	CKD.	CKD.	ENG.
DATE 2007-01-31	DATE 2008/07/16	DATE 08/07/16	DATE 08/07/17
		DWG. NO. 920-509-795	7 SHEET OF 11

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AUTOCAD DWG.

REF. | DWG. NO. 920-509-795 | SHEET 8 OF 11

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-641,DCTAS09-266 & 281.	4.0	2008-07-14

AUTOCAD DWG.

TO PAGE 9

FROM PAGE 7

WH
BK
RD

120-240 VAC
L1
PE
L2
COM

BK #14 AWG
GNYE
GND

POWER SUPPLY PS3

BACKPLANE SUPPLY INTERCONNECTIONS FOR SLOT 4,5 AND 6

OUTPUTS DIGITAL SLOT 5

RD
VAC 1
VAC 2

GND

OUT		
0	BK	ACID DETERGENT PUMP
1	BK	ACID NEUTRALIZER PUMP
2	BK	ALKALINE NEUTRALIZER PUMP NOT USED
3	BK/WH	ACID TANK DUMP VALVE NOT USED
4	VT	ACID TANK FILL VALVE NOT USED
5	BU/BK	ACID TANK RETURN VALVE NOT USED
6	GY	ACID TANK STEAM VALVE NOT USED
7	BK	COOLDOWN TANK MIXER NOT USED

CR3, CR4, CR5, CR1: WH, A2, A1

V7, V8: WH, GNYE, 1, 2

TB3 21, TB3 22: BK

CABLE 20/12 AWG

TO PAGE 10 PNEUMATIC VALVE

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DWN. SV	CKD.	CKD.	ENG.
DATE 2008-12-20	DATE 2008/07/14	DATE 08/02/16	DATE 08/08/17

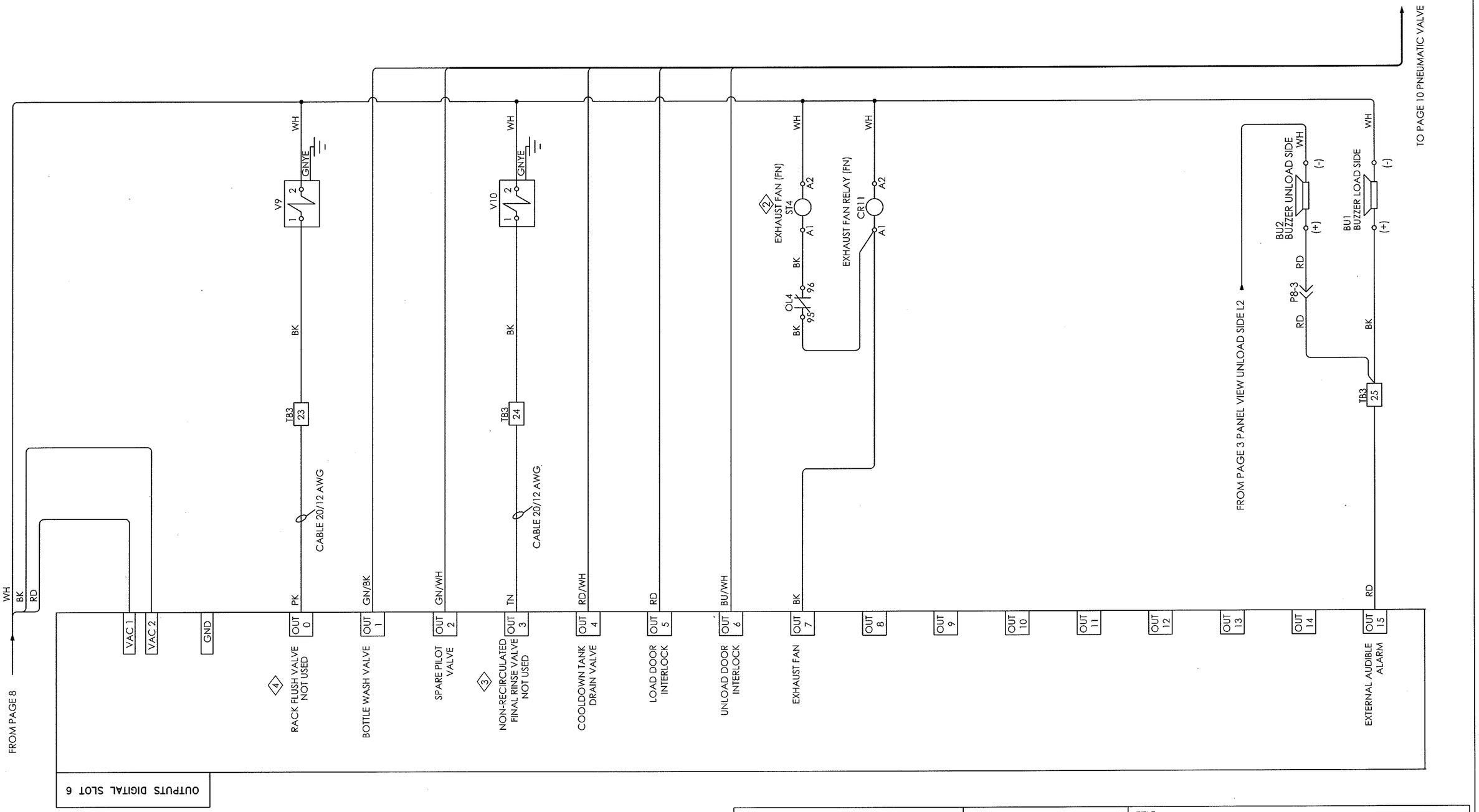
TITLE
BASIL® 4700
CAGE AND RACK WASHER ELECTRICAL SCHEMATIC

DWG. NO. 920-509-795 | SHEET 8 OF 11

AUTOCAD DWG.

DWG. NO.	SHEET OF
920-509-795	9 of 11

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-641,DCTAS09-266 & 281.	4.0	2008-07-14



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DWN. SV	CKD.	CKD.	ENG.
DATE 2008-07-14	DATE 2008/7/10	DATE 08/07/16	DATE 08/07/17

TITLE

BASIL® 4700
CAGE AND RACK WASHER ELECTRICAL SCHEMATIC

DWG. NO.	SHEET OF
920-509-795	9 of 11

REF.

DWG. NO. 920-509-795 SHEET 10 OF 11

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-641,DCTAS09-266 & 281.	4.0	2008-07-14

AUTOCAD DWG.

PV1 LOAD DOOR INTERLOCK

PV2 UNLOAD DOOR INTERLOCK

PV3 SUMP DRAIN VALVE

PV4 JET VALVE SYSTEM

PV5 ALKALINE TANK RETURN VALVE — NOT USED <10>

PV6 ALKALINE TANK DUMP VALVE — NOT USED <10>

PV7 BOTTLE WASH VALVE

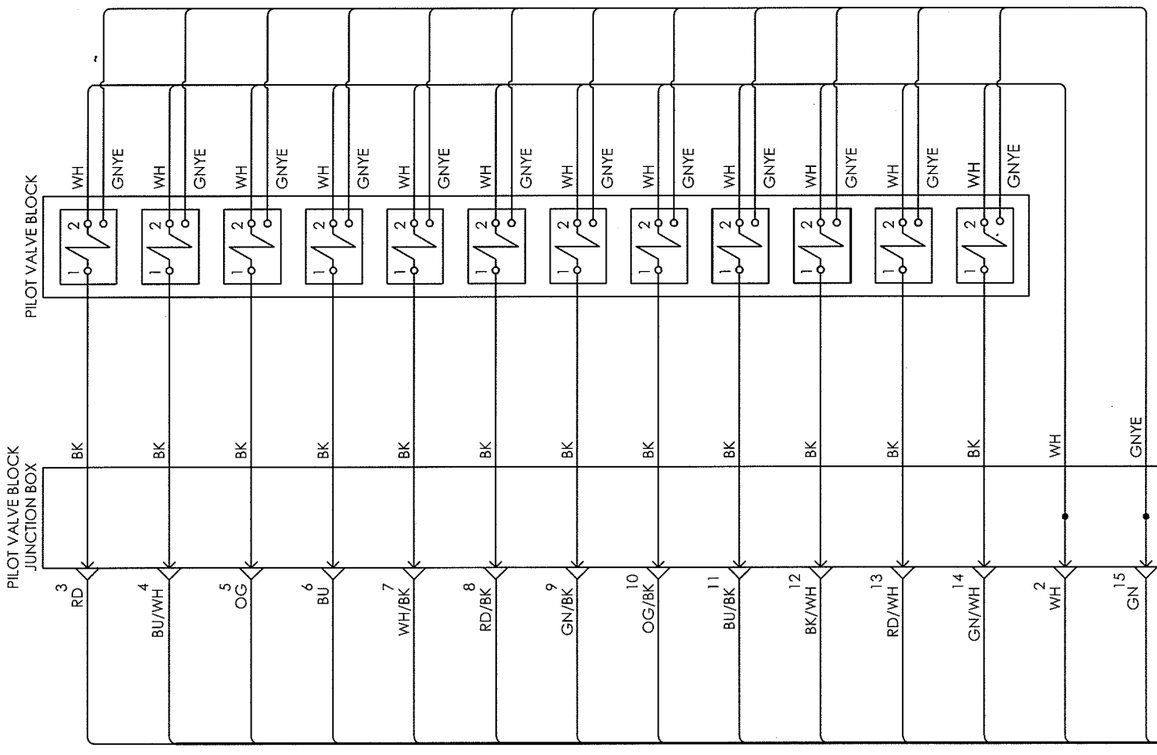
PV8 DAMPER

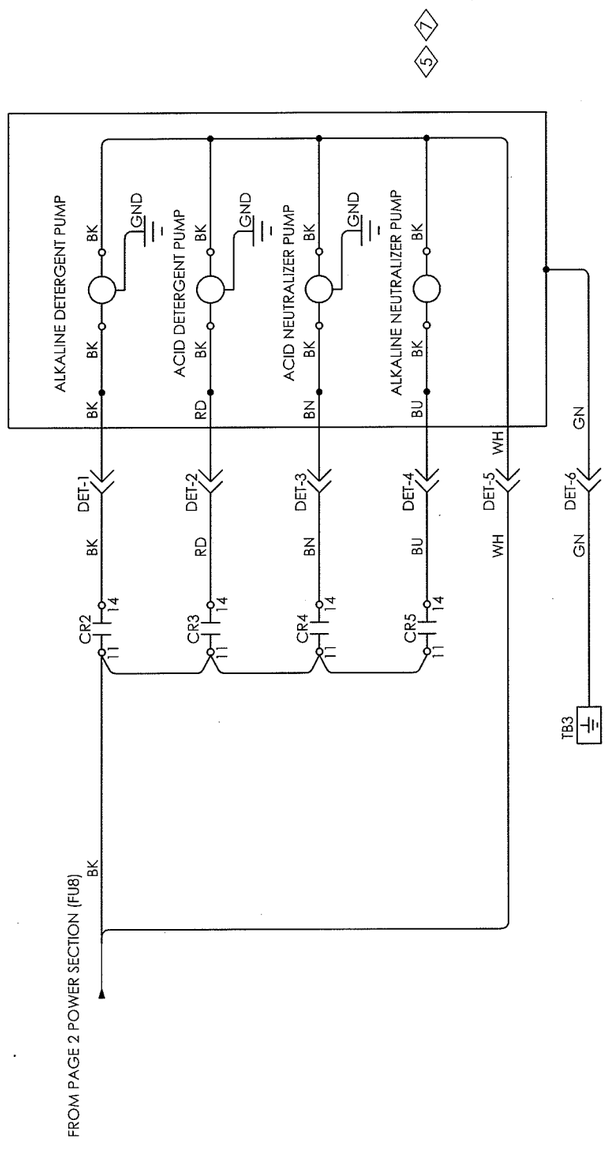
PV9 ACID TANK RETURN VALVE — NOT USED <6>

PV10 ACID TANK DUMP VALVE — NOT USED <6>

PV11 COOLDOWN TANK DRAIN VALVE — NOT USED <5>

SPARE VALVE





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DWN. SV	CKD.	CKD.	ENG. SG
DATE 2008-12-20	DATE 2008/12/17	DATE 08/07/16	DATE 08/07/17

TITLE BASIL® 4700
CAGE AND RACK WASHER
ELECTRICAL SCHEMATIC

DWG. NO. 920-509-795 SHEET 10 OF 11

AUTOCAD DWG.

DWG. NO. 920-509-795 | SHEET 1 OF 11

ENGINEERING CHANGE	REV NO	REVISION DATE
DCTAS08-641,DCTAS09-266 & 281.	4.0	2008-07-14

CONTROL BOX LOAD SIDE — H052490

EMERGENCY CABLE (EC) H051789 EC H051788
LOAD DOOR OPEN (LD) H940801 LD H051790
UNLOAD DOOR OPEN (UD) H940801 UD H051791
SUMP LEVEL (SL) H903117 SL H051792
5 COOL DOWN TANK HIGH LEVEL (CH) H903117 CH H051793
5 COOL DOWN TANK LOW LEVEL (CL) H903117 CL H051794
6 ACID TANK LEVEL (TH) H903117 TH H051795
10 ALKALINE TANK LEVEL (TL) H903117 TL H051796

KEY SWITCH
EMERGENCY STOP BUTTON LOAD SIDE (PB1)

H052363 P11 F EXTERNAL RS232
H052364 P21 F P21 M

PANEL VIEW LOAD SIDE
RS232 DB9 PRINTER OUT M F P10 P12
RS232 DB9 M F P14
ETHERNET RJ45 F M

COMPACTLOGIX
P20 F M DB9M (RS232 SERIAL PORT)
H915655
P15 F M DB9M (RS232 SERIAL PORT)

11 INTERNAL PRINTER P13 F M

RECIRC. PUMP (M1) H052366 M1
H052367 (208V)
H052368 (480V)

TRAVELER MOTOR (M3) H052369 M3
H052370 (208V)
H052371 (480V)

(M4) EXAUST FAN H052372 M4
2 H052373 (208V)
OR
H052374 (480V)

(M5) COOL DOWN MIXING MOTOR H052375 M5
5 & 7 H052376

H052377 DOOR GROUND
H052378 POWER SUPPLY GROUND

M F F

SUMP RTD H955383 RTD0 H052350
10 ALKALINE TANK RTD H955383 RTD1 H052351
6 ACID TANK RTD H955383 RTD2 H052352
5 COOLDOWN TANK RTD H955383 RTD3 H052353

H052503
CHEMICALS PUMPS AND THORNTON CONTROLER BOX

H052348 TA H052349
H051810 TP H052347
H051797 DET H051798

CONDUCTIVITY PROBE
PH PROBE 7

ALKALINE DETERGENT PUMP
ACID DETERGENT PUMP
ACID NEUTRALIZER PUMP
ALKALINE NEUTRALISER PUMP

H052503 CONTROL BOX UNLOAD SIDE

H052361 M F H052379 P17 F M RS232 DB9
P16 P16 F 120V
PANEL VIEW UNLOAD SIDE

H052362 P8 H052359
KEY SWITCH
H052358 PB2 H052360
EMERGENCY BUTTON UNLOAD SIDE PB2

H051799 IL1 INTERIOR CABINET LIGHTS #1 117-903-815
IL2 INTERIOR CABINET LIGHTS #2 117-903-815

H052354 SW3 H052355 CARRIAGE FORWARD (CF) (SW3 TRAVELER LIMIT SWITCH)
H052356 SW4 H052357 CARRIAGE REVERSE (CR) (SW4 TRAVELER LIMIT SWITCH)

H051807 SUMP FILL VALVE (V1)
H051800 SUMP STEAM VALVE (V2)
H051804 ALKALINE TANK FILL VALVE (V3) 10
H051801 ALKALINE TANK STEAM VALVE (V4) 10
H051809 DRAIN COOLING VALVE OR COOLD. TANK FILL VALVE (V5) IF OPTION 5 APPLY
H052803 HEAT EXCHANGER STEAM VALVE (V6) 1
H051805 ACID TANK FILL VALVE (V7) 6
H051802 ACID TANK STEAM VALVE (V8) 6
H051808 RACK FLUSH VALVE (V9) 4
H051806 NON-RECIRCULATED FINAL RINSE VALVE (V10) 3

H915009
PV
LOAD DOOR INTERLOCK SYSTEM (PV1)
UNLOAD DOOR INTERLOCK SYSTEM (PV2)
SUMP DRAIN VALVE (PV3)
JET VALVE SYSTEM (PV4)
ALKALINE TANK RETURN VALVE (PV5) 10
ALKALINE TANK DUMP VALVE (PV6) 10
BOTTLE WASH VALVE (PV7)
AUTOMATIC DAMPERS CYLINDER (PV8)
ACID TANK RETURN VALVE (PV9) 6
ACID TANK DUMP VALVE (PV10) 6
COOL DOWN TANK DRAIN VALVE (PV11) 5
SPARE VALVE (PV12)

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DWN. SV	CKD.	CKD.	ENG.
DATE 2007-01-31	DATE 2008/07/16	DATE 08/07/16	DATE 08/07/17

TITLE: BASIL® 4700 CAGE AND RACK WASHER ELECTRICAL SCHEMATIC

DWG. NO. 920-509-795 | SHEET 11 OF 11

AUTOCAD DWG.

FICHIER 920-509-795

REVISION	CT	DATE	DESCRIPTION:
1.0	CTAS007-009	2007-09-13	-MODIFICATION SYMBOLES DES KEY SWITCH EN PAGE 2 ET RENUMEROTATION DES CONTACTS. -REDISPOSER LE FILLAGE DE PUISSANCE ENTRE LE BORNIER ENTRE LE BORNIER TB1 ET LES PORTES-FUSIBLES FU1A FU5.
REVISION	CT	DATE	DESCRIPTION:
2.0	CTAS007-009	2007-09-26	-AJOUT DES BORNES DE JONCTIONS #17 A 24 PAGE 7,8,9.
REVISION	CT	DATE	DESCRIPTION:
3.0	DCTAS08-550	2008-03-27	-RENUMEROTATION DES CONTACTS DES E-STOP. PAGE 2. -REDISPOSER LE TEXTE SUPERPOSE SUR LE PLAN EN TOTALITE.
REVISION	CT	DATE	DESCRIPTION:
3.1	DCTAS08-569	2008-06-12	-RENUMEROTATION DU RENVOIE DU FIL HAUT PAGE 7 TB3-13 AND TB3-N
REVISION	CT	DATE	DESCRIPTION:
3.2	DCTAS08-175	2008-07-01	-AJOUT DE L'IDENTIFICATION DES MOTEURS DE M1 A M5 EN PAGE 1 & 11.
REVISION	CT	DATE	DESCRIPTION:
4.0	DCTAS008-641	2008-07-14	-REPRESENTATION DU CONNECTEUR DIN AVEC LE POINT DE BRANCHEMENT PAGE 10. -AJOUT D'UN CABLE MULTI-CONDUCTEUR 20/12 EN REMPLACEMENT DES FILS UNIQUES ENTRE LA SORTIE ET LE BORNIER TB3.PAGE 7-8. -CORRECTIONS DE LIGNES SUR DESSINS APPARENTES ET NON NECESSAIRES. -AJOUT D'UN CABLE MULTI-CONDUCTEUR 20/7 EN PAGE 4 -AJOUT DES BORNES 7-8-9-10-11 SUR LAYER STD. PAGE 4 -AJOUTER L'IDENTIFICATION DES MOTEURS M1 A M5. PAGE1
	DCTAS009-266	2008-07-14	-REPRESENTATION DE LA DRAIN COOLDOWN VALVE SUR LE PAGE 7. -CORRIGER LE SYMBOLE DU NIVEAU D'EAU DE LA CUVE. PAGE 4.
	DCTAS009-281	2008-07-14	- ECHANGE DU FIL BLEU & BLANC AVEC LE VERT AU NIVEAU DU BLOC PNEUMATIQUE.PAGE 9 &10